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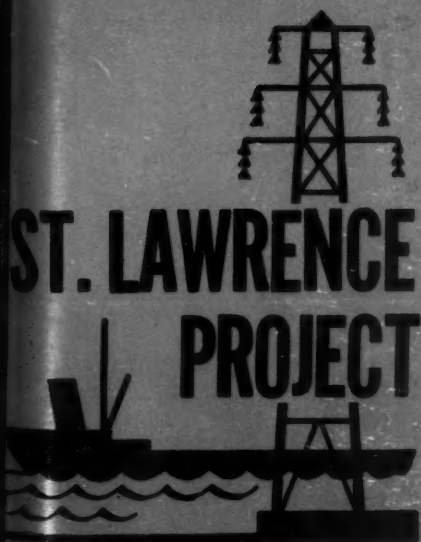
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SCIENCES

DECEMBER 1956

Contractors and Engineers

magazine of modern construction



GRASS RIVER LOCK on the St. Lawrence Seaway

How Gradalls built a \$2,000,000 business for Arnolt Brothers, Inc.



Gradall's ability to work under low ceilings is made use of in this ripping of Belgium Block paving from an approach to New York's Holland Tunnel.



Gradall economically spreads an even 3-inch layer of slag on an oil refinery's storage tank fire wall.



Gradall digs for a pipe run in one of the country's largest refineries. Its telescoping boom enables the operator to easily reach in under pipe bent.

"Our diversified contracts require equipment that can handle many different types of work. Multi-purpose Gradalls perform well on any project—and pay for themselves in 18 months or less", reports President Fred Arnolt, Jr.

Four years ago, when the principals of this small, but progressive dirt-moving organization decided to diversify their activities in order to prosper and grow, equipment selection became an important item.

A magazine advertisement for the multi-purpose Gradall gave them the idea of building their equipment fleet around one machine. As Vice President Marty Jessen tells the story, "The ad claimed that this machine would do 'a dozen' jobs. That was right up our alley. We took the gamble and it has paid off for us—time and time again."

In addition to its contracting business, Arnolt also rents equipment to other contractors. Most of these rentals have been from their fleet of 10 Gradalls. That's because users everywhere know of the machine's extreme versatility and ability to handle such a wide variety of work.

This year Arnolt's business in both the building and utility fields will total over \$2,000,000—and prospects look even better for 1957. Secret of their substantial growth can be attributed to the use of multi-purpose, mobile equipment—like the Gradall.

GRADALLS DO ALL THESE JOBS FOR ARNOLT BROTHERS, INC.

- Highway subgrade excavation
- Ditch cleaning
- Pipe placing
- Trench excavation
- Materials handling
- Pavement removal
- Frost breaking, for pipeline or trench
- Fine grading and slope dressing
- Backfilling
- Fire-bank construction
- Crane work and other lifting
- Pipe stringing
- Ditching
- Sheetpile driving

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Contractors and Engineers

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Long Sault Dam.

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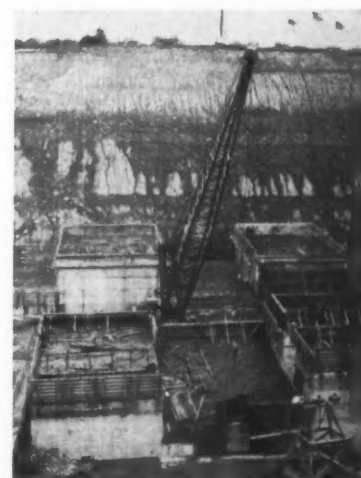
Barnhart Island Powerhouse.

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Grass River Lock.

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Eisenhower Lock.

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Competition—and pressure— and the St. Lawrence projects

Competition was responsible for the extremely low bids made by firms trying to get a piece of the \$900 million being spent on the St. Lawrence Seaway and Power projects.

And this low bidding, combined with a schedule as tight as that for toll-road construction, adverse weather conditions, and the rugged geological makeup of the St. Lawrence area is forcing contractors to use all their construction experience and know-how to keep the projects on time. Work scheduling is so important and so very tight that one contractor wound up three days behind schedule this past season simply because a shipment of concrete buckets was delayed three days.

Some good, however, came out of the low bidding. It resulted in the adoption of every time saving technique, money saving device, and experimental idea that could shave seconds off a particular operation in an attempt to make the seaway and power jobs profitable.

Mechanical breakdowns on these projects are practically nil, since every item that could possibly break down and cause a work stoppage is replaced before it has a chance to wear out.

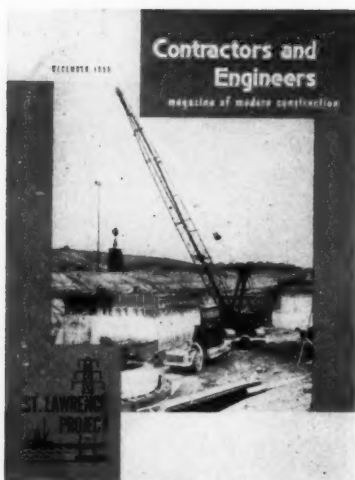
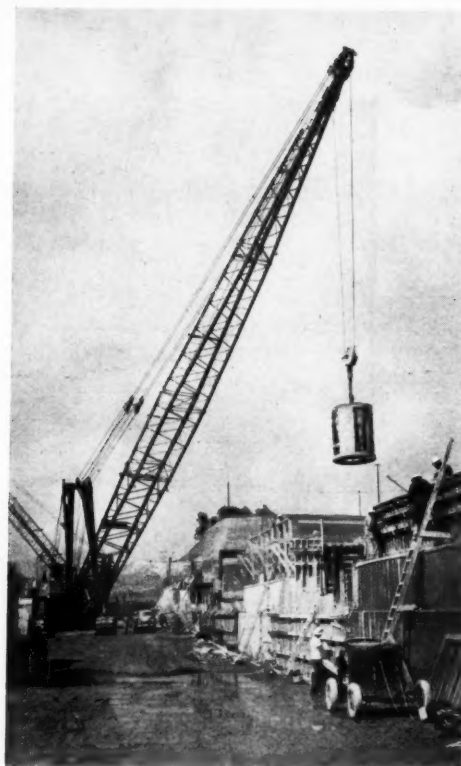
Concrete placing and production, which was pushed from April through October, was an item on which all contractors concentrated their efforts. Automatic batch plants, working

around the clock six days a week, turned out the tremendous yardage required for the navigation and power facilities.

Some firms that were awarded separate earthmoving contracts on low bids actually lost money, and a few even had to default because geological conditions and shaved bid prices worked against them. Glacial till, a combination of clay, sand, gravel, and boulders, was found under a relatively shallow layer of topsoil in this area. Contractors, confident that millions of yards of this material could be removed with a fast scraper operation, found that scrapers were almost useless once the topsoil had been removed. The material when dry or frozen was found to have a density of concrete, and it had to be loosened by

blasting. When it was wet, the till became soupy, muddy, and almost impassable; it literally stuck to the pans of the scrapers and prevented them from dumping properly. Special hauling units with ejector-type bodies had to be used, together with shovels and draglines, to remove the till.

Despite unfavorable working conditions, contractors on major structures are keeping their work on schedule as they combat the difficulties of reshaping and controlling the tremendous flow of the St. Lawrence. But it seems ironic that an unfortunate few contractors placed themselves unwittingly in an untenable financial position as a result of low bidding to get work on which they hoped to make a profit. But such is the element of risk in all contracting.



After placing an empty Blaw-Knox bucket on a Rogers low-bed trailer, a Manitowoc 4500 crane with 120-foot boom swings a full bucket to Blaw-Knox forms on the St. Lawrence's Grass River

Lock. When it is returned empty, and the second full bucket picked off the trailer, the Euclid hauling tractor will take off for batch plant with two empties. Seconds shaved by concrete handling operations are saving time on the job.

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CONTRACTORS AND ENGINEERS



First steps made in

Taming the St. Lawrence

This year saw a tremendous advance made in carving out the new seaway in the St. Lawrence River and building facilities for both the power and seaway projects. These jobs involve a total cash outlay of almost a billion dollars, which is being shared by American and Canadian agencies.

Power project

The Power Authority of the State of New York and the Hydro-Electric Power Commission of Ontario are constructing the St. Lawrence Power Project, which covers a 40-mile section of the river, beginning about 67 miles downstream from Lake Ontario and continuing downstream to a point near Massena, N. Y., between Ogdensburg, N. Y., and Cornwall, Ontario.

Fast concrete operations—made possible by swift, automatic batching setups—were going forward at a good pace throughout this season on the major projects in this \$600 million venture on both sides of the International Boundary. One of the big projects is Long Sault Dam, which will impound water for power purposes (page 6). Others are Barnhart Island Powerhouse (page 24), which is actually two adjoining powerhouses, one on either side of the boundary, and Massena Intake (page 50), which will control water flowing down the Massena Power Canal during and after construction of the power facilities. The last control structure forming part of the power project is Iroquois Dam, which will maintain a constant pool elevation upstream from Long Sault Dam.

Seaway project

The \$320 million navigation project from Lake Erie east to Montreal has two major jobs being done by the St. Lawrence Seaway Development Corp. of the United States. These are the Dwight D. Eisenhower Lock (page 40), and the Grass River Lock (page 32). Both will be used to raise and lower vessels bypassing Long Sault Dam by means of the Long Sault Canal. This 10-mile-long facility 442 feet wide at the bottom and 550 feet wide at the minimum water surface, has a minimum depth of 27 feet. The remaining U. S. projects, which will bring the U. S. cost to \$105 million, include the dredging of shoals in the Thousand Islands section in the area between Clayton and Ogdensburg, and the construction of dikes and bridges in the immediate area of the locks and canals.

The \$215 million projects that will be built by the St. Lawrence Seaway Authority of Canada include two locks

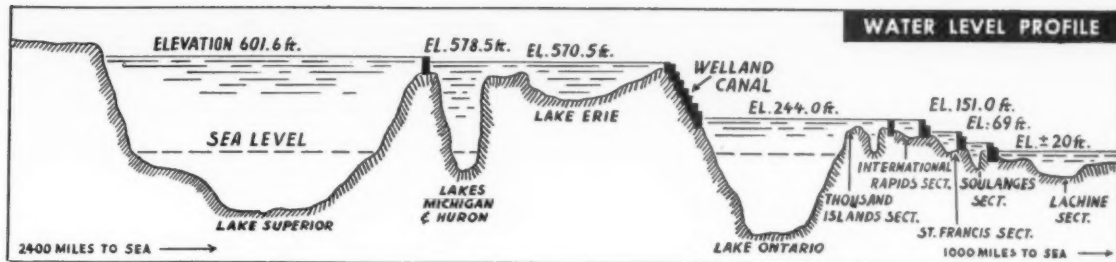
and the dredging of a 27-foot channel in the Beauharnois Canal, a new 18-mile channel with a 27-foot draft; two locks in the Lachine section of the river; the dredging of shoals through Lake St. Francis; a lock and a 6,700-

foot-long canal at Iroquois; and the deepening of the existing 27-mile-long Welland Canal to a 27-foot depth.

Though the power and seaway projects are separate, their location on the St. Lawrence requires that

work on both be coordinated, and this job is being done by the joint American and Canadian committees representing the power and seaway interests.

THE END



Proved under 88,000 vehicles a day on the Benjamin Franklin Bridge

CONTRACTOR

Texaco Asphalt paving on both bridges was constructed by the Union Paving Company of Philadelphia.



Texaco Asphaltic Concrete paving serves new Walt Whitman Bridge

Laying two-course Texaco Asphaltic Concrete pavement on the Walt Whitman Bridge at Philadelphia.

The Benjamin Franklin Bridge, which links Philadelphia with Camden, N. J. over the Delaware River, is one of the nation's busiest traffic arteries. It is used daily by more than 88,000 cars and trucks. Serving this traffic day in and day out is a resilient, heavy-duty Texaco Asphaltic Concrete pavement.

To relieve congestion on the Benjamin Franklin Bridge, the Delaware River Port Authority has erected a new span, the Walt Whitman Bridge, connecting Philadelphia with Gloucester, N. J. This, too, has been paved with Texaco Asphaltic Concrete.

The rugged durability and low upkeep cost of Texaco Asphaltic Concrete under heavy bridge

traffic strongly recommend this pavement wherever heavy traffic must be served. In particular, it is the ideal type of construction for the Interstate Highway System. One of its chief advantages is that its initial cost, when it is laid on a flexible base, is substantially lower than comparable rigid paving.

Helpful information on methods and materials recommended for high-type Texaco Asphaltic Concrete is supplied in a booklet, "Texaco Asphalt Paving—Plant-mixed Types." Copy may be obtained without obligation by writing our nearest office.

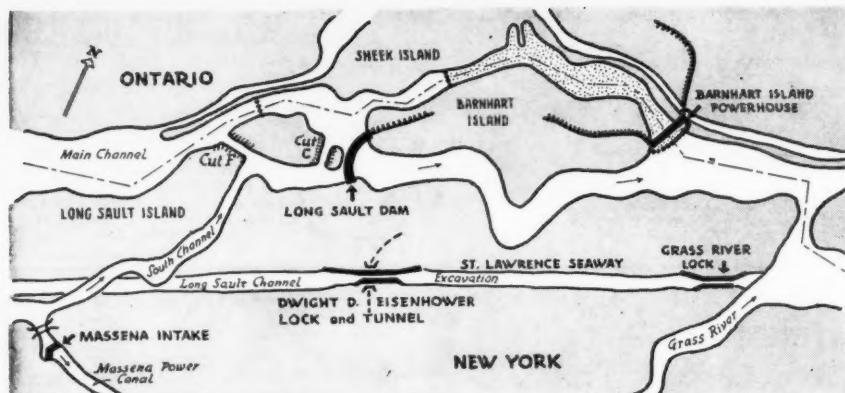


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Five St. Lawrence power and seaway projects, as they will appear on maps of the future.



Long Sault Dam

Intricate diversion plan for St. Lawrence River allows contractor to coordinate work for four-stage construction of dam facility

by **ANTHONY N. MAVROUDIS**,
field editor

Diversion of the St. Lawrence River, both through and around its natural channels, is only one of the tremendous tasks required for each of the four construction stages of Long Sault Dam, the \$26 million New York State Power Authority control structure being built near Massena, N. Y.

Long Sault Dam, a concrete gravity spillway structure with a curved axis having a radius of 1,600 feet, is being built by Walsh, Perini, Morrison-Knudsen, Kiewit & Utah. This is a joint-venture combine consisting of Walsh Construction Co., Inc., New York, N. Y., the sponsor; B. Perini & Sons, Inc., Framingham, Mass.; Morrison-Knudsen Co., Inc., Boise, Idaho; Peter Kiewit Sons' Co., Omaha, Nebr.; and Utah Construction Co., Salt Lake City.

The first 15 piers of Long Sault Dam stretch out behind cofferdam B during stage one work. The first 13 spillways, which will be at elevation 217.0 when the dam is completed, are finished to elevation 162.0 at this time.

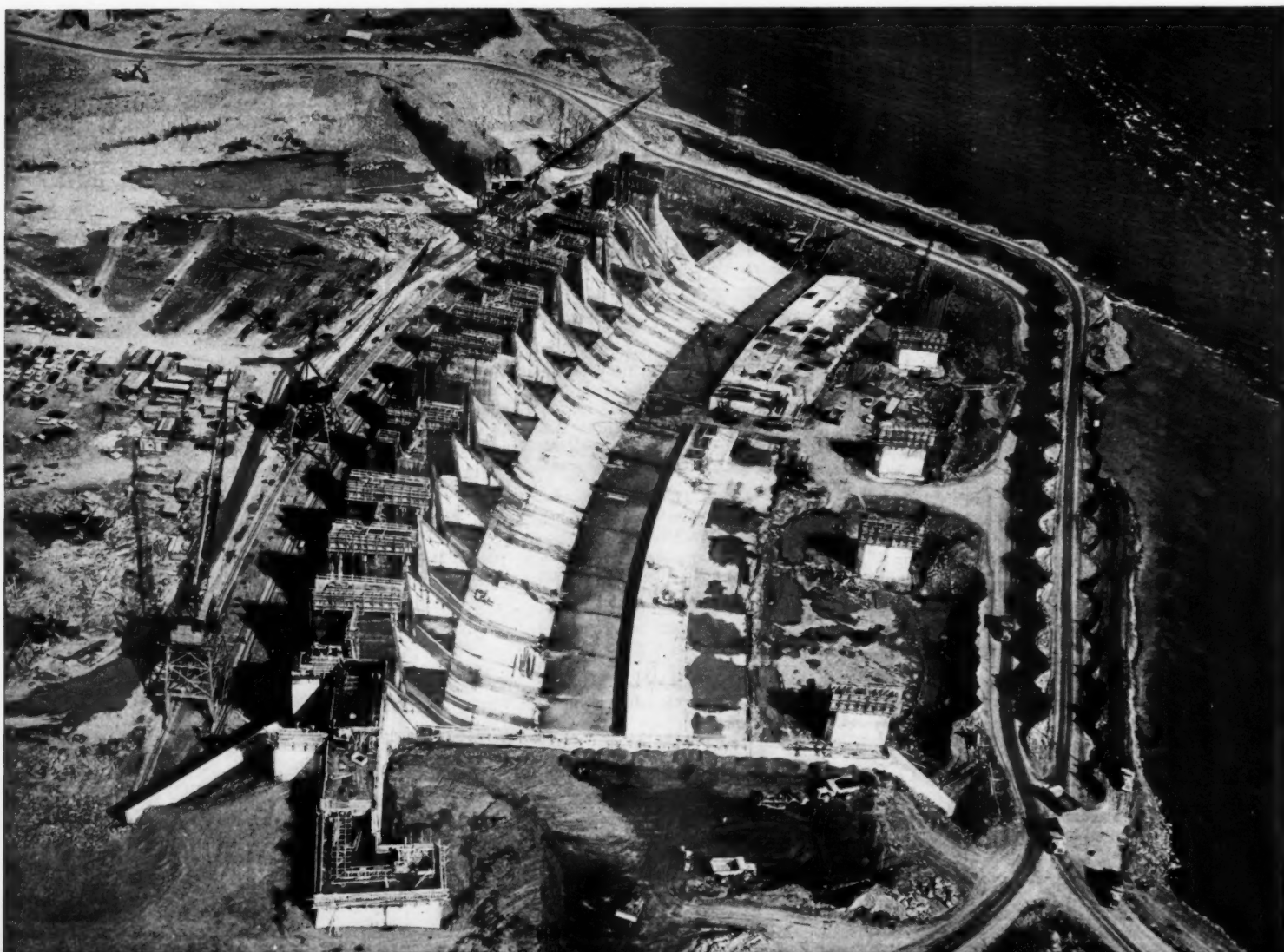
During stage one construction, which was completed in October, the first 13 of 30 spillway sections were partially built to form diversion sluiceways. During this stage, all the river flow was diverted through the north channel of the river. The remaining spillways, numbered 15 through 30 and having temporary diversion tunnels through them, will be built during stage two construction, while the flow is being diverted over the 13 sluiceways formed in stage one. The flow will be diverted through the diversion tunnels in spillways 14 through 30 during stage three, when sluiceways for spillways 1 through 13 are completed. In stage four, the river will flow over the 13 completed spillway crests while the diversion tunnels in spillways 14 through 30

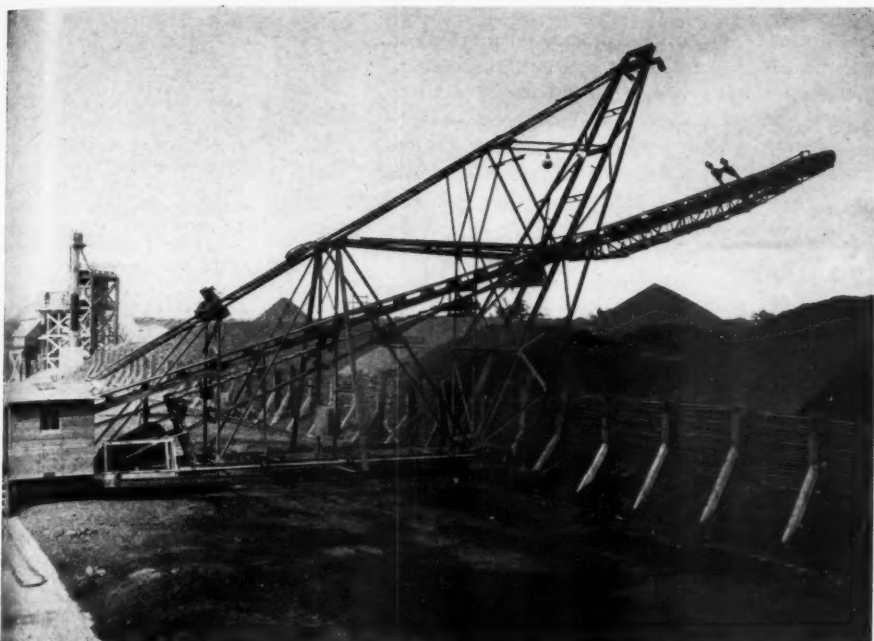
are being filled in with concrete.

First stage construction

Before excavation began in June, 1955, the stage one cofferdams, built under a separate \$1,913,250 contract by Dravo Corp., Pittsburgh, Pa., were unwatered. Cofferdam A, across Long Sault Island's south channel, consists of eight cells. Cofferdam B, downstream from the dam, consists of 25 cells, 15 of them extending in a northerly direction from the United States mainland and the remainder running in a northwesterly direction to tie into the foot of Long Sault Island. Both these cofferdams consist of cells 47 feet 11 inches in diameter, built with 36-foot-long interlocking sheet piling driven to refusal or rock.

(Continued on page 12)



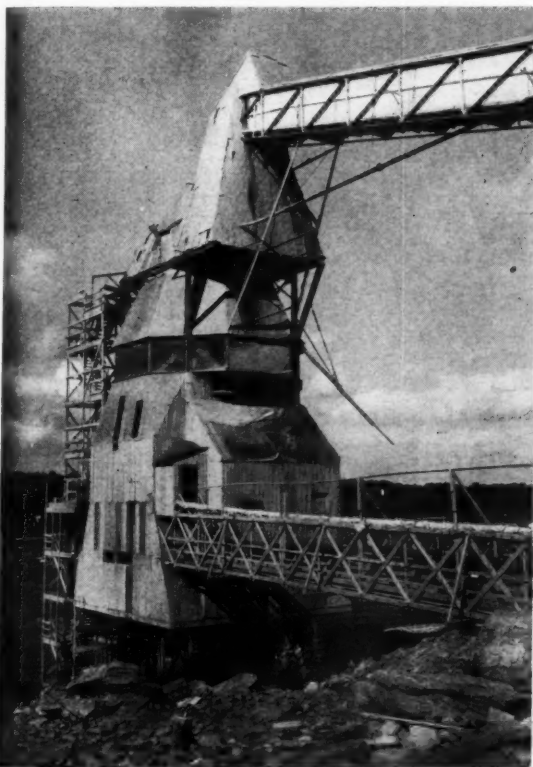


At the batch plant site, just downstream from the south bulkhead of Long Sault Dam, a stacker stockpiles sand and four sizes of stone for the concrete mixes.

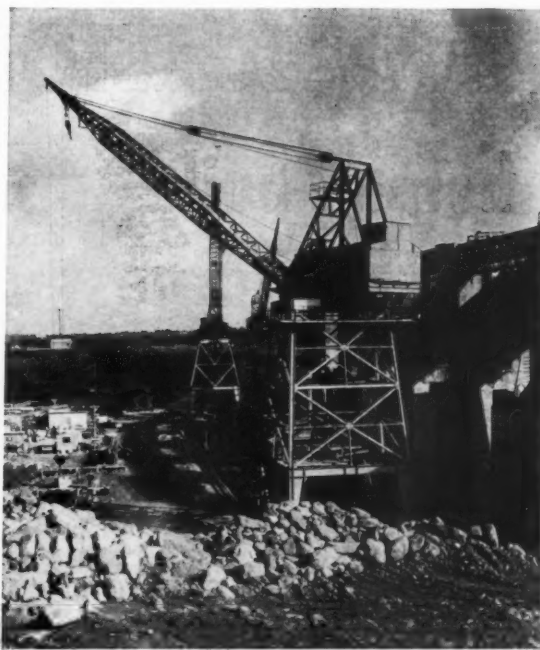


Reclaimed aggregates, fed to an 8-foot-diameter reclaiming tunnel under the stockpiles, pass up an inclined conveyor belt to the Armco-sheeted Tyler washer-shaker.

Automatic batch plant, averaging 2,500 yards of concrete in 24 hours, supplies more than 240,000 yards for first-stage construction of dam



The Johnson batch plant is enclosed with Armco sheeting for protection against the severe weather conditions.



Three American gantries ride on rails along the upstream face of the dam, placing forms and concrete for the structure.

A total of 2,500 cubic yards of mix every 24 hours is average for the completely automatic batching plant supplying the 685,000 cubic yards of concrete needed for Long Sault Dam on the St. Lawrence Seaway. In the best day during stage one construction of the dam, 2,756 cubic yards of concrete was turned out in 24 hours.

Equipped with four Koehring 2-yard tilting-type mixers, each with a mixing cycle of 2 minutes 10 seconds, this C. S. Johnson plant actually started operating on a small scale in October, 1955. Not until this summer did it start working at top production, turning out most of the 240,000 yards of concrete needed for stage one construction by the joint-venture firms of Walsh, Perini, Morrison-Knudsen, Kiewit, & Utah.

Aggregate handling

A single track, leading to the plant site just downstream from the south bulkhead of the dam, is used by the bottom-dump rail cars that deliver $\frac{3}{4}$ -inch, $1\frac{1}{2}$ -inch, 3-inch, and 6-inch stone, plus sand, from the Tecoma quarry at Norwood, N. Y.

These cars dump to an under-the-track hopper that feeds a 36-inch-wide Goodrich conveyor belt on a Link-Belt conveyor. A Hewitt-Robins car shaker, supported by an overhead bridge straddling the rails, is attached to each car to loosen all aggregate particles during the unloading process.

The 36-inch belt running from the under-track hopper end-dumps to a Goodrich 30-inch belt riding over a



The haul road forks at the dam so that concrete can be delivered to the upstream or downstream face. The American gantries working along the upstream face are placing structural steel girders across the piers to support the deck.

(Continued from preceding page)

Link-belt tripper. This tripper feeds a Link-Belt stacker that rides on rails to deposit the sand and the four sizes of stone in their respective stockpiles.

Under these stockpiles is an 8-foot-diameter reclaiming tunnel, built with Armco corrugated plates, that houses a 440-foot-long, 30-inch-wide Goodrich belt on another Link-Belt conveyor. This belt is fed with aggregates and sand through 17 gates.

There are five Johnson gates under the sand pile, three Johnson gates under the stockpile of 3/4-inch stone, three Johnson gates under the 1 1/2-inch aggregate, and two Johnsons flanking a Syntrol under both the 3-inch and 6-inch stone. Each of these gates is activated by a Valvair solenoid switch that is controlled by the operator at the rescreens above the batch plant's aggregate hopper.

The three larger-size aggregates that are reclaimed are first dumped from the reclaiming tunnel to a Tyler washer-shaker so that fines can be removed. A system of nozzles, located over each screen, sprays the stone with water as it passes through or over the Tyrock double-deck vibrating screens. Particles passing both screens are caught in the tub that feeds into a Naylor 12-inch Spiral-weld pipe that discharges into the river. Aggregate leaving the washer shaker is picked up by the 30-inch conveyor belt feeding the two Tyrock double-deck 5x16-foot rescreens located over the Johnson 450-cubic-yard aggregate hopper. Sand and the 3/4-inch stone, which do not require washing, bypass the washer-shaker and continue up the inclined belt to the rescreens.

At this point, the four sizes of rock are separated and the runoff from the screens goes through chutes to specific compartments of the aggregate hopper. Sand, bypassing the rescreens, is fed off the belt, down a chute, and into its compartment.

A Johnson 400-barrel cement silo, located at the center of the aggregate bin, is used for the storage of portland cement. A second Johnson 700-barrel silo, for natural cement storage, is located outside the aggregate bin enclosure. This silo is equipped with a hopper and screw conveyor that transfers natural cement to the batcher.

Natural and portland cement, delivered by trailer tankers, is bottom-dumped into a hopper adjacent to the storage silos—a Johnson 6,800-barrel unit for portland cement and a Johnson 2,300-barrel unit for natural cement. This hopper is so arranged that either type of cement can be picked up by the enclosed bucket elevator and fed to the proper silo.

Portland or natural cement can also bypass the bucket elevator to feed a Fuller-Kinyon air-slide and pump. This method is used to transfer either type of cement from the storage silos to the batch-plant silos. An electronically operated two-way valve at the batch plant is switched to allow portland or natural cement to go to their respective silos. This setup has eliminated the need for rehandling the ce-

ment in a number of instances. When the batch plant requires either type of cement, the material is transferred directly from the trailer tankers to the batch-plant silos by the air-slide and pump.

Contractor-built dust collectors, installed on the top of the natural cement silo at the plant and the two storage silos, prevent the excessive loss of cement that usually occurs during loading operations. These dust collectors consist of stacks of plywood enclosing about 120 vertical tubes. Holes in these tubes, and a series of baffles, side-shoot the cement dust as the silos are being filled. This causes the dust to settle in the collectors. An air-operated vibrator attachment is then turned on, causing the trapped cement dust to fall back into the silo.

Push button plant

The entire plant—with rescreens, aggregate bin, batchers, control room, mixers, and hopper enclosed in Armco aluminum corrugated sheets—is turning out about ten types of concrete mix for this job. A typical 2-yard mix of 6-inch exterior cement concrete consists of:

Portland cement	572 pounds
Natural cement	180 pounds
Sand	1,690 pounds
3/4-inch stone	1,268 pounds
1 1/2-inch stone	980 pounds
3-inch stone	1,440 pounds
6-inch stone	2,074 pounds
Water	354 pounds
Admixture	640 grams

Sand, cement, and aggregates are released from the bin into the batchers by means of an electrical release button, and loading stops automati-

Two American gantries place a natural steel girder across the pier, girders and a box girder, which is encased in concrete, will form the way deck across the dam and provide support for the dam's permanent lifting gantries. ▶

C&E Staff

HOW TEXACO LUBRICATION

helped build world's largest earthfill and concrete dam

By helping to keep a vast array of earth moving and other equipment on the job and running dependably, Texaco Lubricants and Lubrication Engineering Service played an important part in the construction of Folsom Dam, Folsom, California.

Equipment maintenance men there were particularly pleased with Texaco performance. For example—

TEXACO MARFAK—for its ability to protect chassis parts against wear and rust and to stay on the job in spite of heavy loads, jolts, dust and mud.

TEXACO MARFAK HEAVY DUTY—for its ability to seal dirt and moisture out of wheel bearings, to give longer lasting protection with no seasonal change required.



TEXACO ROCK DRILL LUBRICANT EP—for its ability to lubricate effectively and prevent rust whether drills are running or idle.

TEXACO TRACK ROLL LUBRICANT—for the long-lasting protection it gives rollers even under severest conditions.

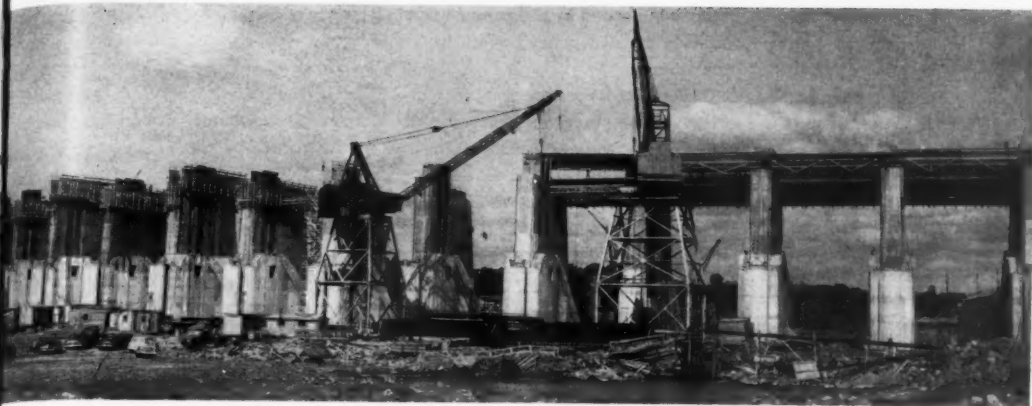
The foregoing are just four of the six basic Texaco Lubricants used in the Texaco Simplified Lubrication Plan to handle all major lubrication. Texaco



TEXACO

CONTRACTORS AND ENGINEERS

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cally when the correct amount of each ingredient has been deposited. This is done by a system of pull wires attached to the batchers and scales in the control room.

The operator pushes another button to open the gates of the batchers and releases the mix to a swivel chute that can be moved to feed any one of the four Koehring 2-yard mixers. The

type of mix and the time of discharge are recorded automatically on a Johnson recording strip in the control room. Water is supplied from a 100,000-gallon storage tank, which is

kept filled with water from the south channel by an 8-inch vertical lift pump.

After the 2-minute and 10-second mixing cycle, the Koehring mixers tilt automatically to empty into a 2-yard wet-batch hopper. A dispatcher releases the concrete into the waiting 4-yard concrete buckets. Each hauling unit—a Brockway tractor pulling a low-bed trailer—is capable of handling three of these buckets. Altogether, there are 16 Johnson and four Gar-Bro air-operated buckets being used on the job.

A two-way phone allows the plant operator to notify the dispatcher of the type of mix turned out and where it should be delivered. The dispatcher, in turn, tells the driver where the mix is to go.

Concrete placement

Concrete delivered to the dam site by Brockway tractors and low-bed trailers was first placed for the south bulkhead, which is 180 feet long, measured along the curved axis of the dam. Pours, in conventional 5-foot lifts, were made in forming that had been fabricated in the contractor's shop set up in the yard. The bulkhead monoliths, about 60 feet long, were built to a height of 115 feet above bedrock, which is at an elevation of about 140.0 under the spillway section.

Three American gantry cranes—two R-25's with 165-foot booms and an R-20 with a 140-foot boom—rode on rails along the upstream face of the dam as they placed concrete for the spillway. Piers 14 and 15, which had a spillway section poured to final crest elevation of 217.0 between them, were poured in 5-foot lifts until the spillway crest was reached. From the spillway crest to the tops of the piers, at elevation 262.0, the 10-foot-thick piers were poured in 10-foot lifts. Ten-foot lifts were also used for the pours on the first 13 piers above elevation 162.0, the height at which the spillway sections were left to form sluiceways for diversion of the river during stage two. Only 5-foot-wide sections of the 50-foot-wide spillway were formed on either side of the piers at this time so that 40-foot-wide sluiceways would be left for diversion.

Formwork for the 10-foot lifts of the inside, unfinished face of the sluiceways was fabricated of 3×10-inch sheeting, backed with 6×10-inch vertical studs spaced on 6-foot centers. Studs were tied to the sheeting with ¾-inch Williams form rods. Williams form hardware is being used exclusively on this project. All the exterior, finished surfaces were formed with 3×10-inch sheeting faced with ¼-inch plywood.

A Manitowoc 3900 crane with 100-foot boom, powered by a Cummins 300-hp torque converter unit, together with a Bucyrus-Erie 71-B crane with a 90-foot boom, poured concrete for the spillway apron. This extends 184 feet 11½ inches downstream from the contraction joint at the toe of the spillway and has a surface that slopes down about 11 feet to an elevation of 140.0 in a distance of 45 feet 4¾ inches. For a distance of 59 feet fur-



U. S. Army, Corps of Engineers photo

FOLSOM DAM on American River near Folsom, California. Merritt-Chapman & Scott Corporation and The Savin Construction Corporation, contractors for main dam (shown), credit Texaco Lubricants and Lubrication Engineering Service with a big assist in keeping construction equipment working dependably and maintenance costs low.

lubrication Engineering Service will gladly develop specific Plan to meet your requirements and help simplify and improve your maintenance lubrication. Just call the nearest of the more than 2,000 Texaco Distributing Plants in the 48 States, or write: The Texas Company, 135 East 42nd Street, New York 17, N. Y.

Lubricants and Fuels

FOR ALL CONTRACTORS' EQUIPMENT

For more facts, use Reader-Reply Card opposite page 18 and circle No. 203

ther downstream, the apron consists of a horizontal 5-foot-thick slab with a surface elevation of 140.0. The apron then rises vertically 12½ feet, forming an energy dissipator, before leveling off for a distance of 40 feet. It then slopes downward 5 feet in a final 40-foot-wide strip before tying into the excavated bedrock.

As the apron was poured, it was tied to the bedrock by dowels that had been drilled and grouted into the bedrock. During these operations, an intricate network of drilled holes and inter-connecting pipelines was embedded in the slabs to provide a water-pressure release and prevent the floating of the apron slabs due to hydrostatic pressure.

All the concrete pours were consolidated by Malan air-operated vi-

brators. Concrete in the apron was finished with a contractor-built screed and cured with a spraying of Hunt Clear Cure curing membrane. This permitted forms to be stripped after 24 hours.

The piers and sluiceways, and any other concrete surface that will be exposed to air, were also stripped after 24 hours and cured with water for 14 days.

The same 100,000-gallon storage tank that supplied water to the batch plant also supplied water for curing purposes. This tank was kept full by an 8-inch vertical-lift pump that pumped water out of the south channel. The pressure head developed in the tank was enough to force water to the pours through a series of lines embedded in the concrete. A booster

pump was needed at the tank to send water to the Koehring mixers in the batch plant.

To complete the concrete work required under stage one, the gantries placed five concrete-encased steel girders and a box girder between the piers to form the roadway deck and provide support for the permanent rails of the two traveling gantries working atop the dam. A roadway, 20 feet wide between curbs, will be formed across the entire length of the dam to provide access to what will become a state park on Barnhart Island.

Personnel

E. W. Simpson is the project manager for Walsh, Perini, Morrison-Knudsen, Kiewit, and Utah, the joint-

venture firms on the job, which were employing about 1,200 men on a 24-hour payroll at the peak of work. Most of the men on the day shift fabricated, placed, and removed forms. Though some concrete was placed during the day, the bulk of it was poured during the swing and graveyard shifts.

The project engineer for the contractor is E. C. Little, the general superintendent is A. L. Simpson, the field engineer is E. R. Haney, and the plant superintendent is Vern Nichols.

H. Fields is the resident engineer, and F. K. Matejka, the project manager, for Uhl, Hall & Rich, Boston, Mass., which is in charge of all power construction work along the St. Lawrence and the consultant for the New York State Power Authority. The chairman of the authority is Robert Moses.

THE END

Civil Service exams open for highway engineers

The U. S. Civil Service Commission has announced examinations for highway engineer positions with the U. S. Bureau of Public Roads, and for student trainee positions with the U. S. Bureau of Reclamation in the Western part of the country and in Alaska.

The highway engineer and highway engineer trainee positions pay from \$3,415 and \$4,480 per year; student engineering trainee, \$3,175 annually; and student civil engineer, \$3,415 a year.

Information regarding the requirements and method of application may be obtained at post offices throughout the country or from the U. S. Civil Service Commission, Washington 25, D. C.

The U. S. Civil Service Commission is now accepting applications for engineer and physical science positions with the Potomac River Naval Command in and near Washington, D. C., and with the Engineer Center, U. S. Army, Fort Belvoir, Va. Beginning annual salaries range from \$4,480 to \$11,610.

Additional information and application forms may be obtained at U. S. post offices, or from the U. S. Civil Service Commission, Washington 25, D. C. Applications must be filed with the Executive Secretary, Board of U. S. Civil Service Examiners for Scientific and Technical Personnel, Potomac River Naval Command, Building 72, Naval Research Laboratory, Washington 25, D. C.

Koehring Co. acquires Buffalo-Springfield

The Koehring Co. of Milwaukee, Wis., has acquired the Buffalo-Springfield Roller Co., Springfield, Ohio. The acquired company will be operated as the Buffalo-Springfield Roller Division of Koehring.

Koehring manufactures concrete finishing and paving equipment, concrete mixers, ditchers, and excavating and hauling equipment. Buffalo-Springfield makes asphalt finishing machines, road rollers, and soil compaction equipment.

CONTRACTORS AND ENGINEERS

Season's Greetings
FROM THE BMCO FAMILY AND ALL ITS DEALERS

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See you at the
ROAD SHOW
CHICAGO
Jan. 28 - Feb. 2, 1957

For more facts, use Reader-Reply Card opposite page 18 and circle No. 204



A workman on the St. Lawrence Seaway Project picks up his can of Campbell's pork and beans from a vending machine on the work site. The machine also contains cans of green pea, tomato, and chicken noodle soup.

Aluminum in architecture subject of two volumes

"Aluminum in Modern Architecture", published in two volumes, is available from the Reinhold Publishing Corp. Volume 1, written by John Peter, pictures aluminum in important buildings throughout the world. Designed for the architect, engineer, and the builder, the book shows how aluminum looks in its many uses, and why it was selected in each building. Tape recorded conversations of 26 great architects about the future of aluminum in modern architecture conclude volume 1.

Volume 2, authored by Paul Weidlinger, is a technical handbook of aluminum engineering, design, and detail. Topics covered in this volume are

the physical and mechanical properties of aluminum; the production, fabrication, and surface finishing of aluminum mill products and castings; joints and connections; and structural design. Information is also included on the potentials and limitations of aluminum as a structural material; architectural design and details; and aluminum piping, ductwork, and insulation. Pictures, diagrams, graphs, charts, tables, and formulas supplement this material.

Volume 1 is priced at \$10 and volume 2 at \$17.50; the complete set can be purchased for \$25 from the Reinhold Publishing Corp., 430 Park Ave., New York, N. Y.

Soup from vending machines keep workers on St. Lawrence Seaway warm

Chicken noodle, green pea, and tomato soup, and pork and beans, made by the Campbell Soup Co. in 8-ounce cans priced at 15 cents each and dispensed through automatic coin-operating machines, are keeping construction workers warm during lunch breaks on the St. Lawrence Seaway Project. Each machine, installed by the Hardy Vending Co. of Massena, N. Y., has a total capacity of 210 cans, which are thermostatically heated to approximately 150 degrees.

The hot soup vendors are housed in two wooden buildings—one located on a dried-out river bed of the St. Lawrence River on the upstream side of the Long Sault control dam, and the other on a similar bed on the upstream side of the Barnhart powerhouse work site.

Lunch hour, actually a 30-minute period, occurs three times during the day—12 noon to 12:30 p. m., 8 to 8:30 p. m., and 4 to 4:30 a. m. A store clerk keeps the buildings open during the lunch breaks.

Since the men are unable to leave their posts, the workmen have arranged a system whereby one member of a particular crew is appointed to pick up a dozen or more cans of hot soup, and bring them back for distribution among the workers.

The vending units were installed early in July, and in spite of the hot weather, it was estimated that an average of 27 cases of soup were consumed daily.

Intrusion-Prepakt joins with Concrete Fabricators

Intrusion-Prepakt, Inc., Cleveland, Ohio, has announced its affiliation with a new organization, Concrete Fabricators, Inc. The new firm will manufacture, sell, and in some cases install prestressed concrete beams for bridges.

John A. Bader, Intrusion-Prepakt's sales manager, will be in charge of the affiliate's operations. Mered McKinzie will be manager of the Crestline, Ohio, plant. The concrete beams, precast and prefabricated at Crestline, will be shipped to bridge construction sites in Ohio and nearby areas.

LORAIN 26

BIG

POWER CLUTCHES RESULTS

A BIG, HEAVY-DUTY 3/4-YD. SHOVEL-CRANE

Here is a powerful and extra-husky 3/4-yd. shovel-crane that can take the constant punishment of hard, heavy-duty service. The Lorain-26 is big, heavy and sturdy. It has lots of power, plenty of clutch capacity and a long and wide crawler, providing excellent stability in the toughest digging. Also available as 15 or 17 1/2-ton crane. Ask your Thew-Lorain Distributor to add more facts to the features listed below—you'll see why the Lorain-26 is the machine to buy for those extra-tough jobs.

TURNABLE FEATURES—“E-Z” controls—all linkage mounted on anti-friction bearings • “Hydra-Ease,” power, crawler controls • New, bigger 18” shoe clutches—for fewer adjustments and longer life • Big, heavy-duty, truss-reinforced, rigid turntable bed • “No-shock, no-stall” hydraulic coupling available.

CRAWLER FEATURES—Wide, long, heavy crawlers • 2 travel speeds in both directions • Wide, 29” drop-forged treads • Sealed idler rollers on anti-friction bearings available • Independent travel available, ideal for hoe and dragline service.

BOOM FEATURES—3 hoe dippers—30” to 40” • Longer, stronger 19-ft. shovel and 19-ft. hoe booms • Full manganese shovel dipper for heavy-duty digging • Independent cable crowd on shovel • Usable as shovel, crane, clamshell, dragline or hoe.

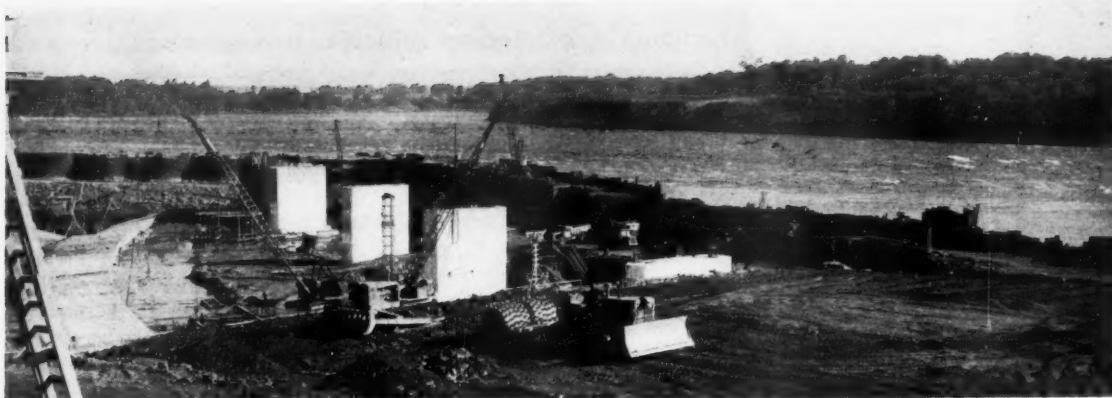


The Lorain-26 Hoe digs deeper in harder materials, has excellent stability to give greater digging ranges. All-welded, box-section, rugged boom is “goosenecked” for deep digging.

THE THEW SHOVEL CO., LORAIN, OHIO



For more facts, use Reader-Reply Card opposite page 18 and circle No. 205



Two Allis-Chalmers HD-21's, one with a sheepfoot roller and the other with a raker attachment, spread and compact backfill along the south training wall of the dam while work is in progress on the piers of the work bridge. The inside sheeting of cofferdam B is being extracted for the second stage cofferdam.

C&E Staff Photos

(Continued from page 6)

The cofferdam cells were backfilled with some of the material excavated from diversion cut C, which Dravo made across the foot of Long Sault Island. The balance of the backfill was imported pit-run gravel. Both the cofferdams and the diversion cut were started in August, 1954.

Completion of the cofferdams gave the joint-venture forces, located on the mainland, access from the mainland to Long Sault Island even before the flow in the south channel was diverted through cut C and into the main channel north of Long Sault Island. Then, when the area between cofferdams A and B had been unwatered, the contractor began excavation to bedrock for the dam foundation.



Stage I construction

Rock excavation will total 280,000 cubic yards for the dam. During stage one, the area for the first 15 spillways was brought to an elevation of about 140.0. The deepest cut made during this stage came to 30 feet.

A fleet of nine wagon drills, including Chicago Pneumatic, Gardner-Denver Air Trac, Joy, Worthington, and Ingersoll-Rand rigs, started the job of breaking up the rock. Air was supplied to the drills by six Joy 700 direct-connected compressors, two Gardner-Denver 600 portable compressors, and a Chicago Pneumatic 900 portable unit.

During this first stage of construction, the joint-venture built the 180-foot-long south bulkhead and training wall, then constructed the first fifteen 10-foot-thick spillway piers, which are on 60-foot centers measured along the axis of the dam. Only the spillway section between piers 14 and 15 and a 25-foot width of the spillway north of pier 15 was completed to the ultimate crest elevation of 217.0. Two diversion tunnels, built through spillway 14, and one, built through the completed half of spillway 15, will provide passages for some of the river flow during stage three construction.

In the first thirteen 50-foot spillway sections, which were brought to an elevation of only 162.0 feet, 5-foot-wide sections were completed to the full elevation of 217.0 feet on either side of the piers. This left 40-foot-wide sluiceways that will be used to divert the flow of water from the main and south channels during stage two construction.

The spillway apron, extending 272 feet 8 inches downstream from the axis of the dam, was also completed out to pier 17, which will be built during stage two construction next season.

engineered by
"pessimists"



As anyone in the construction business knows, it's just good sense to "expect the worst and you won't be disappointed." That's why we stress the fact that the rated capacities of Dorsey Heavy-duty trailers are always conservative, providing a margin of safety against adverse conditions. Our engineers realize the serious losses that can result from failure of equipment that hauls construction machinery.

We invite close scrutiny of all Dorsey specifications: Dimensions of main beams and all other structural members will show any engineer that Dorseys are built "with trouble in mind."

Note, too, that Dorseys come complete with lights, brakes and other items needed for highway use, and tires are full-sized for capacity loads.

MODEL HTS LOW BED

20 Ton capacity — Weighs Only 8,250 pounds (Also available in 15, 25, 30, 35 ton capacities) Although as much as a ton lighter than other trailers of comparable capacity, high-tensile steel main channels and close-spaced all-welded cross members give the HTS superior strength and ruggedness. Flat gooseneck provides support for blades and other loads.

NEW SELF-LOADING FLOAT

This trailer will actually carry 45,000 pounds concentrated in 10 feet of its length! The secret is the extra-deep high-tensile steel main frame that we "tailor" to length and load requirements:

14 inches deep on floats 28 through 31 feet.
16 inches deep for lengths through 35 feet.

THE GIANT PLATFORM

44,000 lb. capacity — Weight: 8,410 lbs.

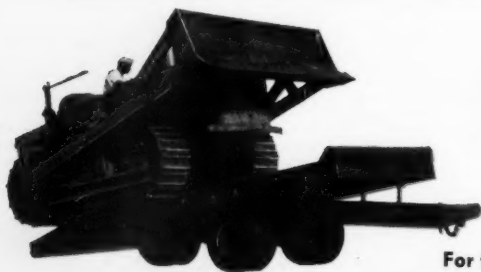
In the year since its introduction, the Giant, with its 18-inch-deep main frame, has become America's No. 1 platform! Although as much as 2,000 lbs. lighter than other platforms, it has even greater strength.



TANDEM TILT-TO-LOAD

15,000 and 20,000 capacities — Weights: 2,500 and 2,700 lbs.

Speed and efficiency as well as economy are combined in this versatile tilt model: it's so light a dump truck pulls it easily. Two-way hydraulic control is so precisely balanced the weight of a man will tilt it up or down. Single axle models also available.



For the complete facts on any model heavy-duty trailer, see your Dorsey Distributor — or wire collect.

DORSEY TRAILERS / ELBA, ALABAMA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 206



CONTRACTORS AND ENGINEERS

Second stage operations

To allow stage two work to get into full swing early in the coming season, the contractor is building three of the stage two cofferdams that will allow the Long Sault Island main channel and part of the Barnhart Island north channel to be unwatered.

One of these is cofferdam D-U, which ties into the upstream face of the dam and Long Sault Island. Another is cofferdam E, between Long Sault Island and the Canadian shore, which is slowing the rate of flow through the rapids section of the channel so that the third cofferdam can be built. This is cofferdam D-D, which ties into the downstream face of the dam and Barnhart Island. The last cofferdam in this system, across the Barnhart Island north channel, had been built previously to permit construction of the Barnhart Island powerhouse about four miles downstream from the dam. Cut C across Long Sault Island, now permitting water to flow around stage one construction, will be plugged so that when cut F is breached, water will flow through the south channel and then through the 13 sluiceways formed during stage one.



Stage II construction

Cut F is also being made across Long Sault Island, but an upstream and a downstream dike are being left to hold back water in the main channel and to facilitate breaching when diversion is to be made.

This cut, requiring the removal of more than 6 million cubic yards of material, is being handled by a joint-venture firm of Peter Kiewit and Morrison-Knudsen under a subcontract that also calls for improving the alignment of the south channel between cofferdam A and cut F. Excavation of cut F is being handled by six machines: a Bucyrus-Erie Monighan with a 15-yard dragline bucket, a Manitowoc with a 6-yard drag bucket, two Bucyrus-Erie 120-B's, a Bucyrus-Erie 150-B electric shovel, and one additional 2½-yard shovel. The excavated material—a combination of silt, sand, marine clay, and glacial till—is being hauled to a huge spoil area adjacent to the cut by a fleet of 30 Euclid 18-yard bottom-dumps.

Excavation of cut F started last year, and during the winter months the subcontracting firms made the freezing weather work for them in at least one instance. Before removing the more than 700,000 cubic yards of material located upstream from the upstream dike in cut F, the joint-venture subcontractors pushed out an earth-fill dike from the shore to close off the area to be excavated. When the water trapped between the dikes froze to a depth of 4 feet, the water

(Continued on next page)



Removal of the enclosure dike in cut F across Long Sault Island is handled by the Manitowoc crane, foreground, and the Bucyrus-Erie Monighan, background. Both rigs worked from the midpoint of the dike toward the shore.

Pittsburgh Contractor Saves 25% ... Cuts Schedule by 30 Days with Big Greenville Ripper



Ripped asphalt is shattered or rolled free.

Things happen fast when the big shanks of the 10,000 pound Greenville Rock Ripper take the full weight and terrific power of an International TD-24! In Pittsburgh this tremendous tool ripped up asphalt, Belgian block, 12" concrete and steel reinforcing rods so easily and quickly that the contractor completed the big West Liberty Avenue job 30 days ahead of schedule at a 25% saving. The contractor has purchased a second Greenville Rip-

per, and now uses it exclusively on all ripping jobs.

The ripper works at depths of 15", 18", and 24" in rock, cemented gravel, caliche, hardpan, paving, and even frozen slag! The rugged shanks work like a jack hammer... swing 30°... have live action that shatters rock which refuses to be raised and rolled free back of the head frame. The shanks, hydraulically operated, give 21½" ground clearance. You get complete ma-



General superintendent inspects ripped pavement on W. Liberty Avenue, Pittsburgh job.

neuverability at no sacrifice in tractor steering. You mount one, two, or three shanks as needed.

Because the powerful Greenville Rock Ripper is tractor-mounted, the tractor can be used for bulldozing and push-loading. It and the big TD-24 are the most potent combination on the market today.



Shattered asphalt loads easily.

For more information write to us or see your nearby International Harvester dealer. See for yourself how you can handle ripping jobs without explosives and frequently without trucks or shovels!



GREENVILLE

STEEL CAR COMPANY

ATECO DIVISION
Greenville, Pennsylvania

For more facts, use Reader-Reply Card opposite page 18 and circle No. 207



Two Caterpillar D8 tractors with dozers spread material from cut F in the spoil area. The dozers keep the area level by pushing the material over the side of the fill, while the Cat No. 12 motor grader doubles up on work by keeping both the fill area and the haul road clean.

C&E Staff Photos

(Continued from preceding page)

beneath the ice was pumped out, and the ice settled between the dikes. A ramp was then built and the Manitowoc dragline walked into the hole to excavate 700,000 cubic yards of material. The Monighan and Manitowoc then were positioned atop the dike while it was breached at the midpoint. Both machines then started removal of the dike, working their way back to shore.

Cofferdam E

Cut F will not be breached until cofferdam E, between Long Sault Island and the Canadian shore, is completed this month. Located just downstream from cut F and above the rapids section of the main channel, cofferdam E is being built up with rock fill to prevent the level of the main channel from rising sharply and causing floods in neighboring areas. During construction, constant pool elevation must be maintained at all times for the Cornwall Canal that runs along the Canadian shoreline and provides a bypass for ships around the rapids section of the river. The canal and its locks are being maintained until the dam is completed, when the entire facility will be flooded out of existence.

The rock fill for cofferdam E is being placed by a cableway that spans the main channel. The 146-foot-high steel head tower is located on Long Sault Island and the 126-foot tail tower is on the Canadian shore, 1,650 feet away. The tail tower, with 750 tons of counterweight to prevent it from overturning, rides upstream and downstream on rails to get the proper width of the cofferdam while a cable car places rock.

The car is capable of supporting 20 tons of rock at mid-span and is powered by a Lidgerwood hoist driven by a General Electric drive motor. The cofferdam, 47 feet high at the maximum point, requires 220,000 cubic yards of rock. This material, supplied from a quarry on the riverbed that is downstream from the cofferdam and



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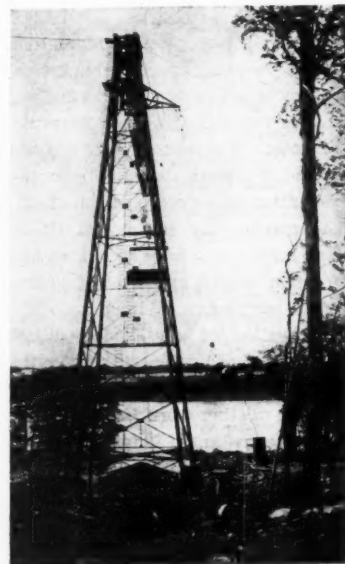
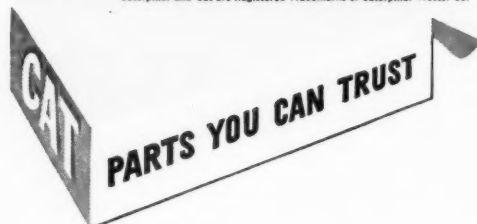
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CATERPILLAR*

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A 20-ton-capacity skip places rock fill for cofferdam E between Long Sault Island and the Canadian shore. The 146-foot-high head tower, foreground, is 1,650 feet from the tail tower on the Canadian shore.

CONTRACTORS AND ENGINEERS



The two permanent traveling gantries that will operate the gates of the dam wait on the south shore, where they have been erected on rails that meet the elevation of rails to be installed atop the dam. When the dam is finished, the embankment south of the dam's bulkhead will be built up and the gantries rolled into place.

upstream from the powerhouse, is being hauled to the cable car by Euclid 25-ton rear-dumps.

Cofferdams D-U and D-D, which tie into the upstream and downstream face of the dam, respectively, between piers 14 and 15 are being built with sheeting pulled from the inside of cofferdam B. A Vulcan 2C extractor mounted on a Bucyrus-Erie 54-B crane handled this job. The new cofferdam cells were driven by a Bucyrus-Erie 71-B and the 54-B, which were equipped with Vulcan 50C and McKiernan-Terry 9-B-3 hammers respectively. These cells have a diameter of about 47 feet and are spaced on 51-foot centers. A porous fill was placed along the inside face of the cofferdams to an elevation 20 feet below the tops of the cells. A 16-foot-wide berm, serving as a roadway around the stage two construction area, tops the fill.

A bridge between cofferdam D-D and the shore, downstream from the spillway apron, will enable the joint-venture firms to get equipment and materials to the unwatered section of the Long Sault Island main channel and the Barnhart Island north channel for stage two construction next season. An earth-fill ramp will lead

from the cofferdam to the work area. The bridge, built on four concrete piers, will span the water that will flow through the 13 sluiceways during stage two construction. Small-diameter liners, rising to the height of the piers and going down into the foundation rock, will be loaded with dynamite when the dam is completed so that the piers can be blasted.

Another important preparation for the coming season was the positioning of the two permanent rail-mounted gantry cranes that will move along the deck of the dam and place the vertical lift gates into temporary rail guides along the upstream face of the dam. These 275-ton capacity gantries were first erected on rails laid on the south shore of the dam and at an elevation equal to the rails

on the deck of the dam.

The contractor then extended the rails over the bulkhead embankment to the permanent rails on the dam and rolled the gantries onto the permanent rails. The gates placed by these gantries will be in an open position while water is being diverted through sluiceways 1 through 13. At this time, stage two construction of spillways 15 through 30, to their crest elevation of 217.0, will be done.

Stage three

These same gates will be closed during stage three work, when sluiceways 1 through 13 will be completed to the crest elevation of the spillways and water will go through the diversion tunnels of spillways 14 through 30. These latter spillways, and those



Stage III construction

built between piers 14 and 15 in stage one, each have two tunnels. These 34 tunnels, measuring 19x16 feet along the upstream face of the spillway and 19x15 feet along the downstream face, will handle the flow of the river during stage three operations.

(Concluded on next page)



EIMCO 105 - A LOADING CYCLE TIME SAVER

Working for a major railway firm in track maintenance operations, an Eimco 105 Tractor-Excavator provides extra-production capacity in loading out a 50-cubic-yard car every eight minutes. The Eimco loads 125 cubic yards more every hour than the machine it replaced.

For this steady job, the 105 is equipped with the high discharge rocker arms and bucket.

The Eimco replaced a 1½ yard shovel that was loading five cars an hour. Before the operator mastered extra-production features of the 105, it was loading six cars an hour. With an experienced operator, it now averages 7½ cars an hour.

Previously, one of two dozers pushing gravel toward the loading edge, came off the 50-foot-high pile to push loaded cars to the switch. The 105 now accomplishes this task

and the shovel and one dozer have been released to work elsewhere.

How does the 1½ yard Eimco, with an initial investment that is nearly one-third less, take on extra duty and still increase production?

The answer is in the 105's ability to save time during every loading cycle. With one hand, the operator pushes two, easy-to-reach levers and the Eimco moves in for a load. Powerful crowding actions fills the bucket quickly. He pulls the levers and the 105 reverses to the haulage car while the loaded bucket is elevating in an arc.

When the Eimco is in dumping position, the bucket is in discharge position. There's no lost motion between loading and discharge.

Independent track control permits the 105 to maneuver fast and sharp—another time saver.

And shifting between high and low speeds—forward and reverse—is done under maximum loads at anytime without injury to the transmission. You don't have to stop to shift—or hesitate until the tachometer needle falls below the recommended RPM reading.

The best way to get an idea how the Eimco 105 will increase your production is to watch it perform. You can arrange this today by writing Eimco.

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 209



The Manitowoc 4500 uses its 6-yard dragline bucket to load a Euclid 25-ton rear-dump with material from the enclosure dike in cut F. The breaching of cut F this month will divert the St. Lawrence through the dam's 13 in-completed spillways.

(Continued from preceding page)

Stage four

In stage four the water will be diverted over the completed spillway crests 1 to 13, which will have gates located in the permanent guides. This will permit the diversion tunnels to be filled while water is being held back by temporary upstream gates in spillway sections 14 through 30. Concrete



Stage IV construction

will be placed through three rows of 2½-foot-diameter tunnels that lead from the downstream face of the spillways to the diversion tunnels. During this final stage, all cofferdams will be removed and dikes completed upstream along a ground elevation of about 245.0.

Non-overflow section

North of the dam's 1,800-foot-long spillway section is a 260-foot-long north bulkhead and a 720-foot-long non-overflow section that will complete the link between the mainland and Barnhart Island. The north bulkhead will be similar to the south bulkhead, which provides an elevator shaft leading to the inspection and grouting gallery that runs through the entire length of the dam. The non-overflow section will consist of a typical gravity-type structure, topped by the 20-foot-wide roadway running across the dam.

The permanent gates for the dam, scheduled for completion by December, 1958, will maintain a normal pool elevation of 238.0 to 242.0. The four types of gates—in sectional and single units—are about 39 feet high. This will raise the spillway crest elevation from 217.0 to about 246.0. The center eighteen gates will be operated by fixed hoists, each with a 175-ton capacity, that will be installed during stage three work. The remaining twelve gates—six on either side of those in the fixed hoist section—will be operated by either of the two traveling cranes on the deck. THE END

Chain Belt Co. acquires General Road Machines

The Chain Belt Co. of Milwaukee, Wis., has acquired General Road Machines, Inc., Niles and Newton Falls, Ohio. For the time being, General Road will be operated as a wholly-owned subsidiary.

The acquisition will complement the line of roadbuilding machinery made by Chain Belt. General Road Machines makes steel forms for concrete roads and other concrete roadbuilding equipment. Chain Belt produces mixers, pumps, pavers, and bulk material-handling equipment.



THE 5,000TH MICHIGAN TRACTOR SHOVEL manufactured by the Clark Equipment Co., Benton Harbor, Mich., will be delivered to the Ohio Gravel Co. by the Bode-Finn Co., Cincinnati, Ohio, a distributor of Clark. Elmer Garrelts, assembly general foreman at Clark's Construction Machinery Division, drives the diesel-powered Model 175A, a 2¼-cubic-yard capacity unit. Looking on is Clarence E. Killebrew, vice president of Clark, right, and the division's plant manager, Phil Hoel.

**distributor
doings**



35% ahead of schedule on the

THANKS TO SINCLAIR



J. W. Smith, Superintendent of J. C. O'Connor & Sons, Inc., reports: "Sinclair Oils and Greases played an important part in this operation. We are approximately 35% ahead of schedule—and most of the equipment has been in almost continuous use since the Spring of 1955. Downtime due to mechanical failure has been held to an absolute minimum."

SINCLAIR LUBRICANTS

CONTRACTORS AND ENGINEERS

Percy "Johnny" C. Johnson, newly appointed salesman for the H. O. Penn Machinery Co., Inc.



Penn Machinery names salesmen, manager

Percy "Johnny" C. Johnson has been appointed by the H. O. Penn Machinery Co., Inc., New York, N. Y., a new salesman for Caterpillar products and the other lines of equipment handled by Penn's Poughkeepsie, N. Y., branch. Johnson will cover Sullivan and Ulster counties.

For the past 25 years, Johnson has been covering this territory for another machinery distributor.

F. Allison Ham has been promoted to assistant branch manager at the Newington, Conn., plant of H. O. Penn Machinery Co., Inc. Mr. Ham was formerly the service manager of the Connecticut plant.

M. J. Vanden Bosch, who has been Penn's New York City engine salesman for the past nine years, will now concentrate on the general line of construction machinery. This line includes Caterpillar diesel tractors, earthmoving equipment, motor graders, Bucyrus-Erie shovels and cranes, and other heavy machinery. Bosch replaces William J. Tuerk, now manager of the Westbury, N. Y., plant.

A new member of the Penn organi-

zation is John D. Burley, who will work with the vice president of sales, R. E. Reed. His headquarters will be in New York City.

Le Roi names distributor

The Le Roi Division of the Westinghouse Air Brake Co., Milwaukee, Wis., has established a new distributor, Le Roi Equipment Sales Co., Inc., at 50-15 Jacobus St., Elmhurst, Long Island, N. Y. The new firm will sell Le Roi products; rent air tools, portable air compressors, and Tractairs; and maintain a parts and service facility.

The boroughs of Brooklyn, Bronx, Manhattan, and Queens, and the counties of Nassau, Suffolk, Dutchess, Putnam, Westchester, and Orange will be handled by the new company.

distributor doings

Vice president and general manager of Le Roi Equipment is Hugh H. Goodwin.

Huber-Warco appoints

The Huber-Warco Co., Marion, Ohio, has appointed the W. W. Williams Co., Columbus, Ohio, distributor for the Huber-Warco line of road machinery and parts. Williams will also offer service and repair facilities for the machinery.

Located at 835 Goodle St., Columbus, the Williams Co. also has branches in Cleveland, Cincinnati, Maumee, and Cadiz, Ohio. J. C. Williams is president and treasurer, and W. W. Williams, Jr., is executive vice president and general manager.

Clark Equipment appoints

Priester Machinery Co., Inc., of Memphis, Tenn., has been appointed by the Clark Equipment Co., Benton Harbor, Mich., to sell and service Michigan tractor shovels and excavator cranes, products of Clark's Construction Machinery Division.

From headquarters at 249 S. Third Street in Memphis, Priester will cover 21 counties in Tennessee, 20 counties in Mississippi, and 10 counties in Arkansas.

Twin Disc Clutch dealer

Blackwood-Hodge, Pty., Ltd., South Granville, N. S. W., Australia, has been appointed the Australian distributor for Twin Disc Clutch AG, Vaduz, Liechtenstein, a foreign subsidiary of the Twin Disc Clutch Co. of Racine, Wis.

The new distributor has branch offices in Melbourne, Adelaide, Perth, and Brisbane.

Baker-Raulang dealer

The Baker-Raulang Co., Cleveland, Ohio, has appointed Miami Fork-Lift Truck, Inc., of Miami, Fla., dealer for Baker's complete line of lift trucks, crane trucks, and front-end loaders. The new dealer will carry a complete stock of parts and will provide service for southern Florida including the counties of Charlotte, Glades, Okeechobee, and Martin.

A-C dealer opens plant

The Bordman Co. of Oklahoma City, Okla., state distributor for the line of construction machinery manufactured by the Allis-Chalmers Mfg. Co., of Milwaukee, Wis., has opened its construction machinery division plant in Oklahoma City.

Howell names sales head

Howell Tractor and Equipment Co., Chicago, Ill., has named L. E. Scott sales manager of the used equipment department. Howell is the northern Illinois distributor for International Harvester Co., Chicago.



the Indiana Turnpike...

TO SINCLAIR OILS AND GREASES!

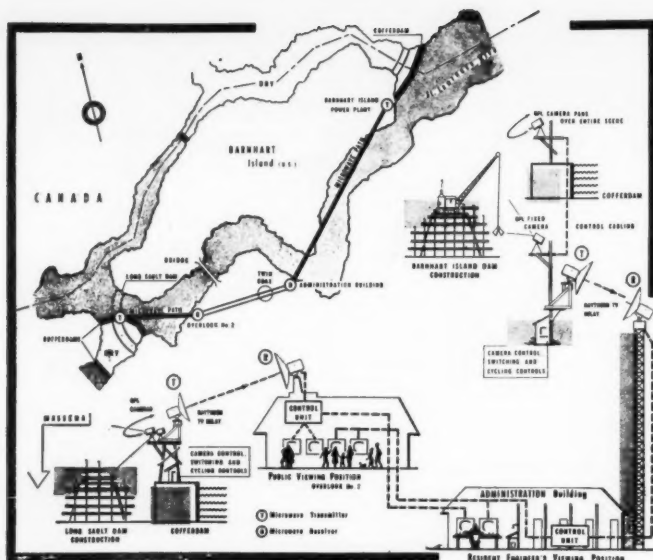
For an outstanding job on the Indiana Turnpike, J. C. O'Connor & Sons, Inc., contractors, share the credit with Sinclair.

Delwin Libby, Grade Superintendent, says: "We have moved just under 3,000,000 yards of sand in seven months. This project has been done using a minimum of types and grades of oils and greases. The result has been a reduction in lubrication inventory, savings in labor, lessening the danger of misapplication, and *no failures due to lubrication*. Sinclair's cooperation has been of great value in helping us make this record."

You too can rely on Sinclair for dependable products and service. Just call your nearest Sinclair representative or write to Sinclair Refining Company, 600 Fifth Avenue, New York 20, N. Y. *There's no obligation!*

For every construction need

For more facts, use Reader-Reply Card opposite page 18 and circle No. 210



TV covers the seaway show

Fixed and scanning cameras on dam and powerhouse projects give authorities on-the-spot pictures of work in progress

The operation of the television network linking both Long Sault Dam and Barnhart Island Powerhouse to the New York Power Authority Administration Building is shown in this combination diagram and map.

Along with the newest ideas, methods, and equipment in use on the St. Lawrence power and seaway projects, a relatively new brainchild of science has been introduced.

A closed-circuit television network—one of the first in use on a construction project—ties the Long Sault Dam and the Barnhart Island Powerhouse projects to the New York State Power Authority Administration Building three miles away. This enables the project manager for Uhl, Hall & Rich, Boston, Mass., and power authority personnel to see just what is going on at each site at any particular moment. With this network in operation, a few minutes at the TV screen is equal to several hours travel around and between the construction sites. Two-way radio, linking the Administration Building to both sites, makes it possible for supplies, equipment, and manpower to be dispatched to places where they are needed in a short time.

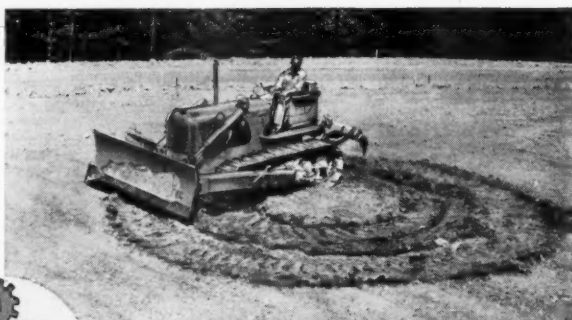
The TV setup, installed by Raytheon Mfg. Co., Waltham, Mass., and General Precision Laboratory, Pleasantville, N. Y., consists of General Precision Laboratory cameras that scan both projects, and Raytheon KTR television microwave relays.

Two GPL cameras are used at both Long Sault Dam and Barnhart Island Powerhouse. Each project has one fixed camera that looks across the entire site, and another camera, equipped with a telephoto lens, that slowly scans an arc of 120 degrees. The fixed cameras are on for 30 seconds, and they alternate with the scanning cameras, which have a 1-minute cycle.

Pictures are transmitted to the Administration Building by Raytheon microwave relays, rather than coaxial cable, since this eliminated the work of stringing cable over many water crossings and does away with the possibility that cable may be damaged by the numerous pieces of construction equipment at each site. **THE END**

New **POWER-TURN** Steering gives you tighter turns with two-track power

Look at that turn! That's what a tight turn looks like with *full power on both tracks*. It means 100% working power at all times, even on the sharpest turns. It means added work capacity. It's **POWER-TURN** steering—another exclusive Oliver development.



...More push for your profits, too!

With 53 drawbar h.p., the OC-12 is one of the most powerful tractors of its class. Now **POWER-TURN** makes it pay still bigger dividends. You sweep through turns of *any* radius with full load. Or hold a straight line in angle dozing with the heaviest off-center loads.

Yet **POWER-TURN** is actually simpler. Two interconnected systems of control provide planetary reduction gears on each track. Here is the maximum in efficient flow of power, 100% tractive

turns, better maneuvering. Operation is easier, too, with finger-tip controls to take all the muscle out of it.

In addition to **POWER-TURN**, the new OC-12 offers new over-center hand clutch and foot brake for greater operator convenience. Why not sit at the controls yourself and see the difference? Your Oliver distributor will gladly demonstrate. Call him today.

THE OLIVER CORPORATION

400 West Madison Street, Chicago 6, Illinois



A COMPLETE LINE OF INDUSTRIAL WHEEL AND CRAWLER TRACTORS AND MATCHED ALLIED EQUIPMENT

For more facts, use Reader-Reply Card opposite page 18 and circle No. 211

National Highway Users awards state of Illinois

The National Highway Users Conference presented the Golden Milestone Award to the state of Illinois in recognition of its 1955 program reports on highway development by the State Department of Public Works and Buildings. The presentation was made at the LaSalle Hotel in Chicago, Ill., in October.

CONTRACTORS AND ENGINEERS

Convention calendar

January 7-11, 1957 Highway Research Board

Thirty-sixth Annual Meeting, Sheraton-Park Hotel, Washington, D. C. Fred Burggraf, director, HRB, 2101 Constitution Ave., Washington 25, D. C.

January 15-17, National Crushed Stone Association

Annual Convention, Americana Hotel, Miami Beach, Fla. J. R. Boyd, executive director, NCSA, 1415 Elliot Place N. W., Washington 7, D. C.

January 17 The Beavers

Annual Awards Dinner, Biltmore Bowl, Los Angeles, Calif. J. W. Watson, assistant secretary-treasurer, The Beavers, P. O. 3428, Terminal Annex, Los Angeles 54, Calif.

January 17-19 Associated General Contractors of Minnesota

Meeting, Hotel Leamington, Minneapolis, Minn. AGCM, 910 Builders Exchange Bldg., Minneapolis 2, Minn.

January 27-30 Associated Equipment Distributors

Thirty-eighth Annual Meeting, Conrad Hilton Hotel, Chicago, Ill. P. D. Hermann, executive secretary, AED, 30 E. Cedar St., Chicago, Ill.

January 28-31 Plant Maintenance and Engineering Show

Exhibit, Public Auditorium, Cleveland, Ohio. Clapp & Poliak, Inc., 341 Madison Ave., New York 17, N. Y.

January 28-February 2 American Road Builders' Association

Combined Conference and Road Show, International Amphitheatre, Chicago, Ill. Louis W. Prentiss, executive vice president, ARBA, World Center Bldg., Washington, D. C.

January 30-31 Midwest Welding Conference

Third Annual Conference, Chemistry Bldg., Illinois Institute of Technology, Chicago, Ill. Harry Schwartzbart, supervisor of welding research, MWC, Armour Research Foundation, Illinois Institute of Technology, 35 W. 33rd St., Chicago 16.

January 31-February 2 National Bituminous Concrete Association

Second Annual Convention, Conrad Hilton Hotel, Chicago, Ill. H. K. Griffith, executive director, NBCA, 1145 19th St. N. W., Suite 218, Washington 6, D. C.

February 4-8 American Society for Testing Materials

Committee Week, Benjamin Franklin Hotel, Philadelphia, Pa. Fred F. Van Atta, assistant secretary, ASTM, 1916 Race St., Philadelphia 3, Pa.

February 11-14 National Sand and Gravel Association and National Ready-Mix Concrete Association

Forty-first Annual Meeting of the NSGA, and the Twenty-seventh Annual Meeting of the NRMCA, Hotel Statler, Los Angeles, Calif. Vincent P. Ahearn, executive secretary, NSGA-NRMCA, Munsey Bldg., Washington 4, D. C.

February 19-20 Concrete Short Course

Meeting, New Engineering Bldg., Nashville, Tenn. Wm. H. Rowan, CSC, Box 1603, Vanderbilt University, Nashville 5, Tenn.

February 25-26 Georgia Highway Conference

Sixth Annual Conference, Georgia Institute of Technology, Atlanta, Ga. Radnor J. Paquette, Georgia Institute of Technology, Atlanta, Ga.

February 25-27 Association of Asphalt Paving Technologists

Annual Meeting and Technical Session, Atlanta Biltmore Hotel, Atlanta, Ga. Ward K. Parr, secretary-treasurer, AAPT, 1224 E. Engineering Bldg., Ann Arbor, Mich.

February 25-28 American Concrete Institute

Annual Meeting, Statler-Hilton Hotel, Dallas, Texas. Wm. A. Naples, secretary-treasurer, ACI, 18263 W. McNichols Road, Detroit 19, Mich.

DECEMBER, 1956

February 27-March 1 Association of Highway Officials of North Atlantic States

Meeting, Hotel Traymore, Atlantic City, N. J. Kenneth D. Rice, secretary, AHONAS, c/o State Highway Department, 1035 Parkway Ave., Trenton, N. J.

February 27-March 2 American Concrete Pipe Association

Meeting, Shoreham Hotel, Washington, D. C. Howard F. Peckworth, managing director, ACPA, 228 N. LaSalle St., Chicago 1, Ill.

February 28-March 1 Highway Engineering Conference of University of Colorado

Thirtieth Annual Conference, University Memorial Bldg., Boulder, Colo. Roderick L. Downing, conference chairman, HECUC, 207 Engineering Bldg., No. 1, University of Colorado, Boulder, Colo.

February 28-March 1 Illinois Traffic Engineering Conference

Meeting, Illini Union Bldg., University of Illinois, Urbana, Ill. R. K. Newton, engineering extension supervisor, ITEC, 116 D Illini Hall, University of Illinois, Urbana, Ill.

Civil engineering field covered in two volumes

"American Civil Engineering Practice", volumes 1 and 2, edited by Robert W. Abbett, presents the fundamental principles, procedures, and data of modern civil engineering. Volume 1 covers metropolitan and community planning, surveying, and traffic, highway, airport, and railroad engineering. Other chapters discuss

soil mechanics and similar subjects.

Hydraulics and pumping, hydrology, dams, and river engineering are some of the topics included in volume 2. Other chapters give information on hydroelectric power, irrigation and land drainage, public water supply, sewerage and sewage disposal, refuse collection and disposal, and harbor engineering.

Each volume contains graphs, diagrams, charts, and tables, as well as an index. Volume 3 will be published some time next year.

Priced at \$15 each, the books may be obtained from the publisher, John Wiley & Sons, Inc., 440 Fourth Ave., New York 16, N. Y.

NEW "KING-SIZE" CARTRIDGES SAVE TIME AND LABOR

Now, Hercules produces "King-Size" cartridges in lengths of 24, 20, 16 and 12 inches, and in diameters of 1¼, 1½, 1¾, and 2 inches.

Available in all types of Hercules® dynamite, these long-length, small-diameter cartridges are now in full production.

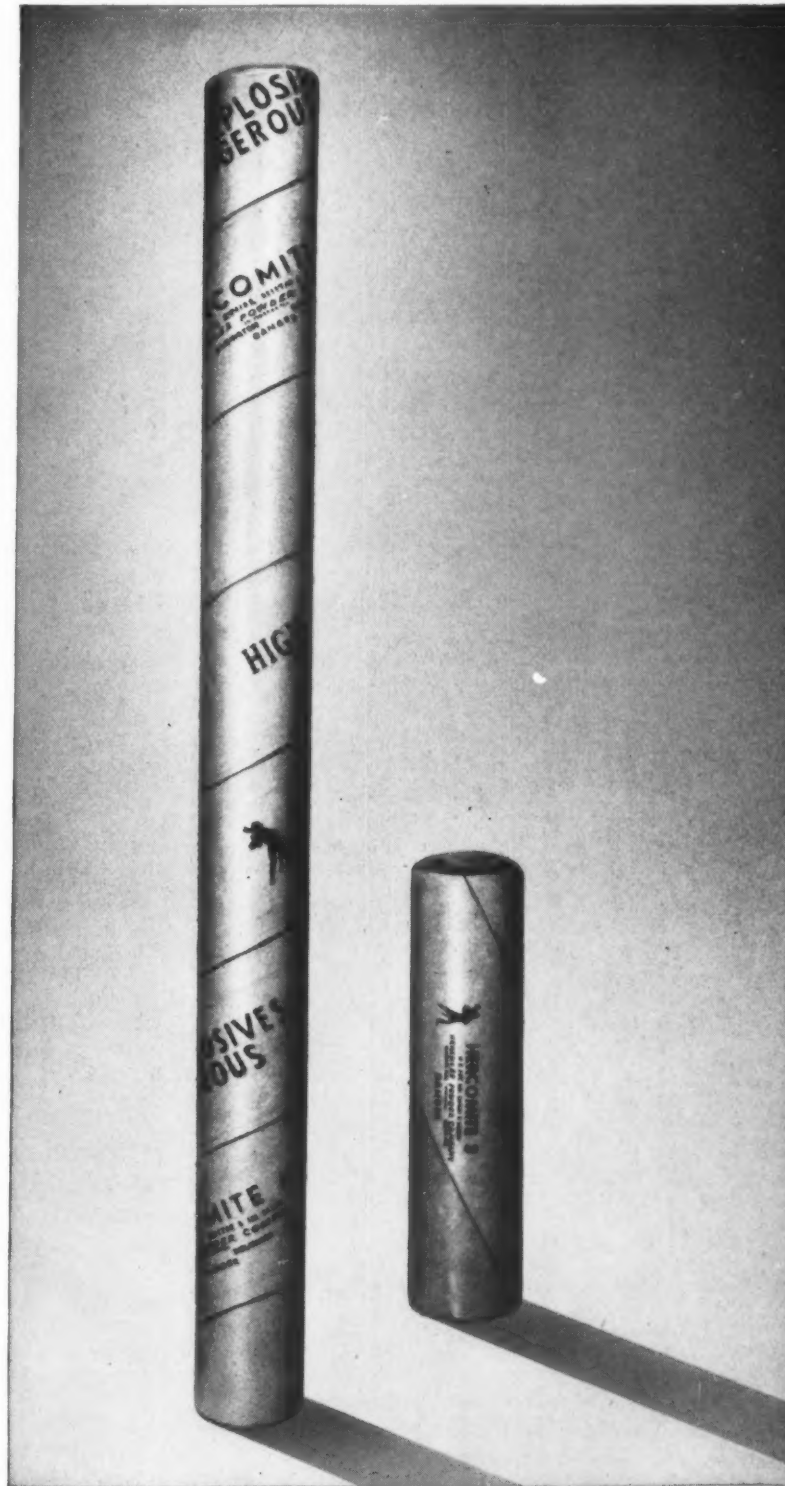
"King-Size" cartridges make possible a more uniform fragmentation through the discharge of a single column of explosive. Their use means substantial savings in valuable time and labor in loading holes.

Hercules designed, tested, and installed special new packing machines for these "King-Size" cartridges.

Our technical service and sales representatives will be glad to discuss with you how these "King-Size" cartridges can go to work for you.

HERCULES

For more facts, use Reader-Reply Card opposite page 18 and circle No. 212



THREE TIMES AS LONG... Here is one of the new "King-Size" Hercules cartridges—24 inches in length, shown alongside the same grade in the conventional 8 inch size.

HERCULES POWDER COMPANY

Explosives Department, 965 Market St., Wilmington, Del.

Birmingham, Ala.; Chicago, Ill.; Duluth, Minn.; Hazleton, Pa.; Joplin, Mo.; Los Angeles, Cal.; New York, N.Y.; Pittsburgh, Pa.; Salt Lake City, Utah; San Francisco, Cal.

manufacturer memos



Paul J. Wolfert, the new sales manager for the Construction Machinery Division of Blaw-Knox Co.

Blaw-Knox Co. appoints Paul J. Wolfert manager

The Blaw-Knox Co. of Pittsburgh, Pa., has appointed Paul J. Wolfert

sales manager of the firm's Construction Machinery Division at Mattoon, Ill. A member of Blaw-Knox since 1939, Wolfert has had 26 years experience in construction equipment engineering and sales, the last 12 years as supervisor of export sales for that department.

Wolfert holds the post formerly held by Robert P. McKenrick, who resigned.

Standard Steel promotes Kalmeyer vice president

Walter J. Kalmeyer has been promoted to vice president of Standard Steel Corp. of Los Angeles, Calif. At the same time Clay C. Hopper was named assistant general manager, Norman Pitt was appointed chief en-



Walter J. Kalmeyer, the new vice president of Standard Steel Corp.

gineer, and Edward J. Meier was made the public relations director.

Kalmeyer will continue to act as promotion manager in addition to supervising all phases of manufacturing for the company. Before joining Standard Steel, he was associated with the Blaw-Knox Co. for 23 years.

Hopper will assist executive vice president C. N. Rees in the management and administration of the com-

pany, with particular emphasis on the sales and development of rotary kilns, dryers, and other equipment.

As chief engineer, Norman Pitt will be responsible for the supervision of all design and engineering activities on products, including asphalt plants, kilns, retorts, dryers and coolers. Meier will handle publicity, convention and trade show participation, and other public events.

Caterpillar names three; forms foreign trade group

The Caterpillar Tractor Co., Peoria, Ill., has appointed Albert N. Whitlock manager of the Aurora, Ill., plant. R. A. Morgan succeeds Whitlock as controller, and George J. Wellner has been elected treasurer of the company, to fill the post vacated by V. V. Grant, who is now vice president of the newly organized foreign trade group.

The foreign trade group will bring together into one organization all activities concerned with the firm's foreign business. The group comprises Caterpillar's present subsidiaries in Australia, Brazil, and Great Britain, and two new subsidiaries, Caterpillar Americas Co. and Caterpillar Overseas C. A. President of this group is William Blackie, and vice presidents are W. J. Bornholdt, V. V. Grant, J. R. Munro, and G. E. Spain. Both Mr. Blackie and Mr. Spain will continue to hold the office of executive vice president and vice president, respectively, of the parent company.

Caterpillar has also formed two domestic divisions—Manufacturing, and Parts and Service. The Manufacturing Division will include the firm's eight U. S. manufacturing plants and three general office departments. This division is headed by vice-president C. A. Woodley. The Parts and Service Division, headed by vice president E. W. Jackson, will include the service department, and the parts-distribution and sales department.

Heltzel Steel Form names Boden general manager

R. O. Boden has been named general manager of the Heltzel Steel Form & Iron Co., Warren, Ohio, and its subsidiaries, the Flexible Road Joint Machine Co. of Warren, and the Ohio Structural Steel Co. of Newton Falls, Ohio.

Boden has been associated with various consulting firms and manufacturing companies in the Pittsburgh, Pa., area. He succeeds Carl J. Heltzel, who resigned from the post of general manager to devote more time to his job as president of the firm.

Huber-Warco names salesman

The Huber-Warco Co. of Marion, Ohio, has appointed C. R. Dabney district sales representative for Texas, Oklahoma, Arkansas, Louisiana, and New Mexico. From headquarters at 6620 Pimlico Drive in Dallas, Texas, Dabney will sell and service Huber-Warco motor graders, tandem rollers, and the firm's Maintainer.



Cost advantage or not, contractors still prefer ARMCO PIPE

Usually, the installed cost of Armco Corrugated Metal Drainage Structures is lower than that of other types. But there may be times and conditions when there is little cost differential. And still contractors prefer to buy Armco Pipe!

Why is this true?

First of all, there is the matter of delivery. No matter where your job is located, there is a nearby Armco manufacturing plant from which you can get quick delivery of Armco products.

Even more important, according to many contractors, Armco doesn't operate on the principle of "sell and forget." The Armco man—a combination of salesman and engineer—usually works closely with the contractor during installation of large or complex jobs. What's more, he is always on call to answer questions, and make suggestions or recommendations (when asked). Contractors find him a handy man to have around.



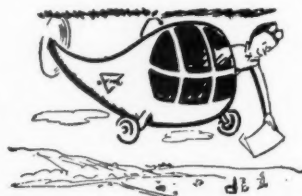
Reputation for high quality

For more than 50 years Armco has been a prime producer of corrugated metal drainage structures. These products, based on many years of research and practical field experience, are well-known throughout the construction industry for their high quality.

Armco subcontracts assure profit

Sometimes, because of lack of manpower, equipment or specialized experience, you may prefer to subcontract the installation of Armco products. The Armco Construction Department will handle the job on a fixed-price basis. Costs are low, the service is not competitive with prime contractors.

Write us for more data on Armco Corrugated Metal Pipe or Armco MULTI-PLATE Drainage Structures. Armco Drainage & Metal Products, Inc., 4136 Curtis Street, Middletown, Ohio. Subsidiary of Armco Steel Corporation. In Canada: write Guelph, Ontario. Export: The Armco International Corporation.



ARMCO CORRUGATED METAL DRAINAGE STRUCTURES



For more facts, use Reader-Reply Card opposite page 18 and circle No. 213



James A. Drain, vice president and general manager of Joy Mfg. Co.'s Mining and Construction Division.

Joy Mfg. Co. names new vice president, manager

James A. Drain has been named to the newly created post of vice president and general manager of the Mining and Construction Division of Joy Mfg. Co., Pittsburgh, Pa. In his new position, Drain will be responsible for research, engineering, manufacturing, and sales of the division's products.

A graduate of Massachusetts Institute of Technology, Drain was formerly president of Joy's subsidiary, Joy Mfg. Co. of Canada.

Diamond Iron Works news

John H. Harrigan, Jr., has been appointed district sales manager for the Diamond Iron Works Division, Goodman Mfg. Co., of Chicago, Ill. Mr. Harrigan will cover New England, New York, Pennsylvania, New Jersey, and Delaware, as well as the Canadian maritime provinces.

DeWalt promotes two

DeWalt Inc., Lancaster, Pa., manufacturer of power tools, has named Charles W. Snyder to fill the newly-created post of industrial sales specialist, and Howard L. Herschok to succeed Mr. Snyder as Philadelphia, Pa., district sales manager.

Snyder and Herschok have served the company in other capacities.



Clarence E. Elsas, the new president of the Fulton Bag & Cotton Mills.

Fulton Bag & Cotton Mills elects Elsas president

Clarence E. Elsas has been elected president of the Fulton Bag & Cotton Mills, Atlanta, Ga. He succeeds R. O. Arnold, who resigned.

A 30-year veteran with Fulton, Elsas has served in many of the company's district offices and manufacturing plants, as well as in executive capacities. In June of this year he was elected executive vice president.

He is a past president of the Textile Bag Manufacturers Association.



G. A. Gilbertson, the newly elected president and chief operating officer of the Frank G. Hough Co.

Frank G. Hough Co. names president, board chairman

G. A. Gilbertson has been made president and chief operating officer of the Frank G. Hough Co., Libertyville, Ill., according to a recent announcement. He was formerly the firm's vice president and general manager.

Frank G. Hough, founder of the

company and until recently its president, has been appointed chairman of the board.

Oliver forms division, elects vice presidents

Samuel W. White, Jr., and Donald W. Koegle have been elected vice presidents of the Oliver Corp., Chicago, Ill. Mr. White will head the industrial sales division, and Mr. Koegle will be in charge of domestic farm machinery sales.

At the same time, vice president Edward H. Fisher has been appointed head of the newly created special products division, supervising all United States and Canadian sales of the firm's industrial and defense products.

BRIDGE-BUILDING WITH LOW COST SONOTUBES!



Providence River Bridge, North-South Freeway, Providence, R. I. Rhode Island Dept. of Public Works, Div. of Roads & Bridges. M. A. Gammino Company, contractors. Charles A. Maguire & Associates, Boston, consulting engineers. Photo: Courtesy New England Construction

SONOTUBE[®]

FIBRE FORMS

for round columns of concrete

The typical river bent for the Providence River Bridge included a concrete girder about 140 feet long supported on eight 36 inch diameter round concrete columns formed by SONOTUBES.

These columns, in turn, are supported by a solid granite-faced pier section resting on a heavy tremie seal foundation and long steel H-piles.

Figure on using SONOTUBE Fibre Forms on your next bridge-building job and save time, money and labor!

Low-cost SONOTUBES are available in practically all sizes up to 48" I.D. and to 48' long. Order in required lengths or saw to your specifications on the job.

Use Sonoco's patented "A-Coated" SONOTUBES for finished columns; wax-coated also available.

For complete technical data and prices, write



SONOCO PRODUCTS COMPANY
CONSTRUCTION PRODUCTS DIVISION
HARTSVILLE, S. C.

LOS ANGELES, CAL. 5955 SOUTH WESTERN AVE. MONTCLAIR, N. J. 14 SOUTH PARK STREET
AKRON, IND. • LONGVIEW, TEXAS • BRANTFORD, ONT. • MEXICO, D. F.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 215

WHEN IT'S **COLD** keep your job moving WITH



Clayton SUMMAIRE

"300"
340,000 BTU's
at 2400 cu. ft. of
air per minute
\$350.00

"Packaged Weather" Speeds Operations

Quick starts for heavy equipment on cold mornings... protection against freezing of concrete while curing... comfort for men working in semi-enclosed areas. These are but a few of the production benefits provided by the Clayton Summaire "300" Portable Heater in keeping jobs on schedule.

UP TO 375,000 BTU'S PER HR. AT LOW COST

Series "300" Clayton Summaire Heaters are made in three models; electric or gasoline engine drive; with or without automatic temperature control for confined areas. Capacities range from 320,000 to 375,000 BTU's per hour, with up to 2700 cu. ft. of heated air delivered per minute. Temperature rise as high as 170°F. Uses less than 2½ gals. fuel oil or kerosene per hour; runs 10-11 hours without refueling. Enclosed combustion chamber insures odorless, safe operation. Ask for demonstration.

PRE-HEATING
MOTORIZED
EQUIPMENT FOR
EASY STARTING

DRYING NEW
CONSTRUCTION;
PLASTER, PAINT
AND MASONRY

SPACE HEATING
SEMI-ENCLOSED
WORK AREAS

THAWING OUT
FROZEN BULK
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PREVENTING THE
FREEZING OF
CONCRETE IN
CURING STAGE

CLAYTON MANUFACTURING CO.
BOX 550, EL MONTE, CALIF. CE-1256

() Send me literature on new Model "120" Summaire
() Send me literature on Model "300" Summaire
() I'd like a free on-the-job demonstration without obligation

NAME _____
FIRM _____
ADDRESS _____
CITY _____ STATE _____



Box 550
El Monte, California

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 214



Oil filter manufacturer provides "extra" service on St. Lawrence projects

A manufacturer of lube and fuel-oil filters is doing more than just supply contractors on the St. Lawrence sea-way and power projects with filter cartridge replacements. Wix Corp., Gastonia, N. C., is providing a tailor-made maintenance service for every contractor using Wix filters on the project; these include, among others, Kiewit-Johnson-Johnson on the Iroquois Dam; Peter Kiewit and Morrison-Knudsen on the Long Sault Canal excavation; and S. J. Groves on the Route 37 bypass around Massena.

Here's how the service works: a Wix factory-trained representative makes out a fleet survey form at the various projects, listing all the equipment used, together with the correct filter

Wix service simplifies selection of proper filter cartridge replacement.



cartridge for each piece of machinery. The cartridge information is secured by checking the parts books of engine manufacturers as well as the equipment itself.

This survey form—made regardless of the amount of equipment on the project or the number of filters ordered—is sent to the Gastonia headquarters of Wix Corp., where it is typed and the finished form slipped into a glassine case to be forwarded to the contractor.

Merely by consulting the list, the contractor or maintenance superintendent can find the particular type of filter cartridge required for any piece of equipment on the spread. This list may include many types of machines—made by Euclid, Caterpillar, LeTourneau-Westinghouse, International, Allis-Chalmers etc.—which may use any one of the 183 types of replacement cartridges made by Wix Corp. As the contractor or maintenance superintendent determines which filter cartridges are needed, he can place one order for them with a single distributor.

Along with the survey form, Wix also makes available to contractors, free of charge, a fleet manual in which a written record of filter and oil changes and other necessary maintenance checks may be made.

A copy of the survey form also goes to the Wix distributor supplying the contractor with cartridges. In this

case, it is Gouverneur Auto Parts Co., Gouverneur, N. Y., which is supplying St. Lawrence contractors from a branch in Massena, N. Y. With the copy, the distributor is able to keep a

wix OIL FILTER DATA						Bill Smith Construction Co. Compiled for Potsdam, N. Y. Date of Survey October 12, 1956	
VEHICLE NO.	MAKE AND TYPE OF EQUIPMENT	LUBE OR FUEL	WIX REPLACEMENT CARTRIDGE	VEHICLE NO.	MAKE AND TYPE OF EQUIPMENT	LUBE OR FUEL	WIX REPLACEMENT CARTRIDGE
1	Dodge	Lube	CW-11-UG	1 & 2	Gradall	Lube	CW-155-H
2	Ford	Lube	PC-1-F		Primary	Fuel	CW-147MP
4	Autocar	Lube	CW-750-MS		Secondary	Fuel	CW-148MP
		Fuel	CW-62	1	Caterpillar #112 Grader	Lube	CW-162MP
5	Sterling	Lube	CW-22			Fuel	CW-171
		Fuel	CW-62	2	Caterpillar #12 Grader	Lube	CW-161MP
		Lube	HB-F Bag			Fuel	CW-171
6	Ford	Lube	PC-4-FP	3	Warco Grader	Lube	CW-146MP
7	GMC	Lube	PC-5-A			Fuel	CW-158MP

This typical fleet survey form, made out by a Wix representative, gives the contractor a reference guide for proper filter replacement.

stock of all the filter cartridges being used by equipment on the job. This assures the contractor that the cartridges he needs will be available when he needs them. Since the dis-

tributor keeps a good supply of the oil filters on hand, there is little possibility that a contractor will be left with a heavy filter inventory when its construction job is completed. THE END

In place of wasteful and uncertain crankcase-oil changing based upon mileage or hours in service, many operators of heavy-duty construction equipment now use a better guide that saves them both time and money.

Now you can test used oil in minutes

IT HAS COME as something of a surprise to some maintenance men to discover that they have been throwing away hundreds of gallons of still-good oil . . . year after year. Conversely, it is quite a jolt to realize that a costly engine-repair job could have been prevented by an on-the-spot analysis that would have shown up the condition . . . in minutes!

The recommendations for oil changes issued by engine makers have always been computed on "averages" for the various classes of vehicle service. And like the "average" man on the insurance chart, the average vehicle doesn't exist in the actual fleet. For example, two bulldozers of the same make and model, operating on the same job, can have quite different patterns of oil economy and engine condition. Obviously no one set of rules can apply ideally to all units. And fortunately there is no longer any need for such generalization.

From a couple of drops of used oil, the Shell "ADC* Oilprint Analysis" provides a reliable check of oil condition, in minutes. It is very simple, and with a

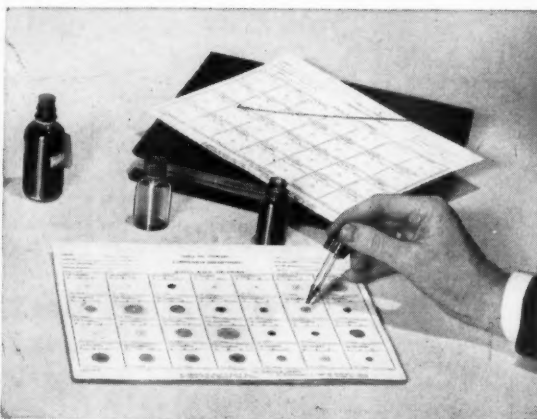
little practice, it tells you a lot about that oil and the engine that uses it.

What a drop of used oil shows: You place a drop of used oil on a piece of special filter paper supplied by Shell . . . let it stand a minute or two. You will then be able to see the following:

Water dilution: Even a tiny amount of water shows up . . . and that means not only that your oil is losing its ability to protect engine parts, but it also shows whether the water represents a normal amount of condensation or something more serious, such as an actual leakage of coolant from a faulty jacket.

Dispersancy/detergency: The same oil drop will give you a picture of how well the special additives in the oil are doing their job . . . whether or not the contaminants are being held in suspension where they do least harm . . . whether the cleansing and dispersing actions are adequate . . . whether the oil is still good.

Adulteration: The color of the oil spot will show whether too much contamination is occurring . . . and will very often point up the cause, indicating a check on



The simple test setup: sample bottles, a wire rod, a bottle of "indicator," and the permanent record card.



This single, on-the-spot sample reveals many things about an engine.

Book compiled on British civil engineering history

An illustrated history of "The British Civil Engineering Contracting Industry" is now available from the publisher, The Federation of Civil Engineering Contractors. The book is divided into five general categories: transport and communications, fuel and power, public health, war, and industry.

Under the first topic are included canals, railways, docks and harbors, roads, and airports. Gasworks, power stations, hydroelectric plants, and atomic power are developed under the category of fuel and power. Public health is subdivided into water sup-

ply, drainage and sewerage, sea defences, and recreation facilities. Royal engineer construction units and ordnance factories, airfields, shelters and fortifications, and essential services and communications are described in the chapter on war. The last category, industry, is concerned with steel, agriculture, and atomic factories. Job photos supplement each topic.

The 190-page book, priced at \$15 (3 guineas English money), is available from the publisher, The Federation of Civil Engineering Contractors, Romney House, Tufton St., Westminster, S.W.1, England.

Reinforcing rods are visible through the layer of Visqueen film as concrete is dumped for a roof pour. Concrete goes directly onto the reinforcing mesh and film.



Plastic film substituted for forms in roof pour

Visqueen polyethylene film plus strategically placed 16-inch I-beams provided enough support for a concrete roof pour and eliminated the need for form panels. The roof, erected for a restaurant in Twisp, Wash., measures 72 feet x 24 feet 1/2 inch.

According to the contractor, R. D. Schrier, the I-beams, spaced on 8-foot centers, support 3/8-inch reinforcing rods that are laid at 6-inch intervals. The rods transverse the I-beams and support more 3/8-inch rods, spaced 6 inches apart, parallel to the I-beams. The rods are tied to form a mesh. Six mil Visqueen film, laid across the reinforcing rods, was covered with the standard reinforcing mesh. Concrete was poured directly onto the film and, when the concrete had set, the temporary planking that enabled workmen to wheel the concrete to the pours was removed.

The roof is spaced 24 inches above the ceiling, allowing for a dead air space for electrical and plumbing fixtures.

Architects' detail sheets compiled in third series

A selection of 96 scale drawings has been compiled in the third series of "Architects' Detail Sheets". Edited by Edward D. Mills, the book emphasizes constructional applications of practical value.

Topics covered in the 232-page book include balconies, entrances, fittings, wall details, staircases, and windows. An index of architects and an international glossary of terms in French, German, Spanish, and English conclude the book.

Published by the Philosophical Library, Inc., 15 E. 40th St., New York 16, N. Y., the book is priced at \$12.

Structural steel detailing topic of three courses

Three courses on structural steel detailing are in progress at the Mechanics Institute in New York, N. Y. Two elementary classes deal with the fundamentals of simple beam and column detailing.

The third class studies the more intricate types of detailing that come into a fabricator's drafting room. The courses are sponsored by Lawrence Schacht, president of the Schacht Steel Construction, Inc., and Harry L. Vogel, president of the Institute of Steel Detailers.



A fleet superintendent sees how easily the test is made.

injectors, nozzles, oil and air filters of diesels, or on plugs, carburetors and filters of gasoline engines.

All of the above can be learned from the single drop of oil . . . in an amazingly short time.

Alkalinity: Engine wear and engine deposits increase as the oil becomes acidic in nature due to contamination from combustion products. A special indicating fluid, developed in Shell Laboratories, tells at a glance whether oil is alkaline and still usable, or acid and how much.

Operators who keep an ADC Oilprint Analysis record of each vehicle generally find that the crankcase oil stands up longer than they had figured . . . a distinct saving in lubrication cost. At the same time, there is a running check on each engine that often detects impending trouble before its correction becomes costly. In this respect, the Shell ADC Oilprint Analysis qualifies definitely as one of the valuable recent tools of preventive maintenance.

If you are concerned with extending the service of crankcase oil, and with avoiding the risk of using oils loaded with contaminants, we suggest that you have one of the Shell service engineers demonstrate ADC Oilprint Analysis for you.

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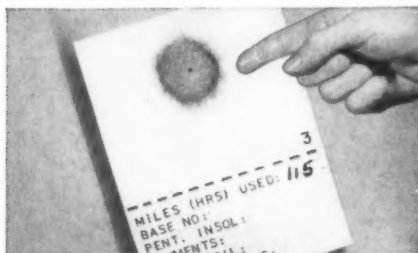
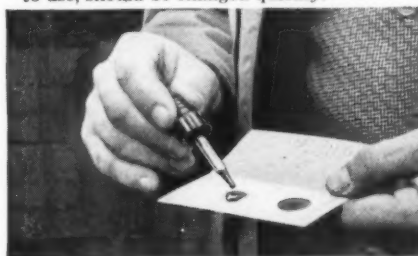


Photo shows an oil-spot test card...one phase in the visual life record of a charge of oil.

The Shell "indicator" shows acidity instantly. If spot turns red, oil is no longer fit to use, should be changed quickly.

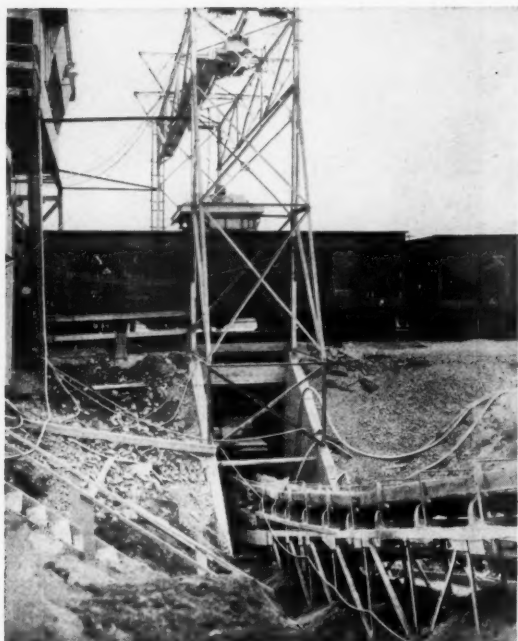


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A Hewitt-Robins car shakeout assists in emptying a rail car. The undertrack hopper feeds a Barber-Greene 30-inch belt riding a Barber-Greene conveyor over the various stockpiles.



Aggregates and sand leave the stockpiles through a reclaiming tunnel, passing first through this Allis-Chalmers double-deck washing screen, then continuing up the conveyor, right, to the batch plant.

Barnhart Island Powerhouse

Concrete forming, placing, and production for the Barnhart Island Powerhouse on the St. Lawrence River, in full swing this past season, is being done with practically every trick in the trade to keep the job on schedule.

The 3,300-foot-long facility being built on either side of the International Boundary by the New York State Power Authority and the Hydro-Electric Power Commission of Ontario, Canada, will be the world's second largest hydro-electric power producing plant when it is completed in December, 1959. Its 32 generators—16 on the American side and 16 on the Canadian side—will produce a total of 1,880,000 kw as compared to the 1,947,000 kw now being generated by Grand Coulee Dam.

Work on the \$36,500,000 U. S. portion of the powerhouse was started in June, 1955, by the joint venture of Perini, Walsh, Morrison-Knudsen, Kiewit & Utah, with B. Perini & Sons, Inc., Framingham, Mass., as sponsor,



A contractor-adapted batch truck—a Euclid truck with two Koehring 4-yard Dumptor bodies that side-dump directly to concrete buckets—leaves the Johnson plant.

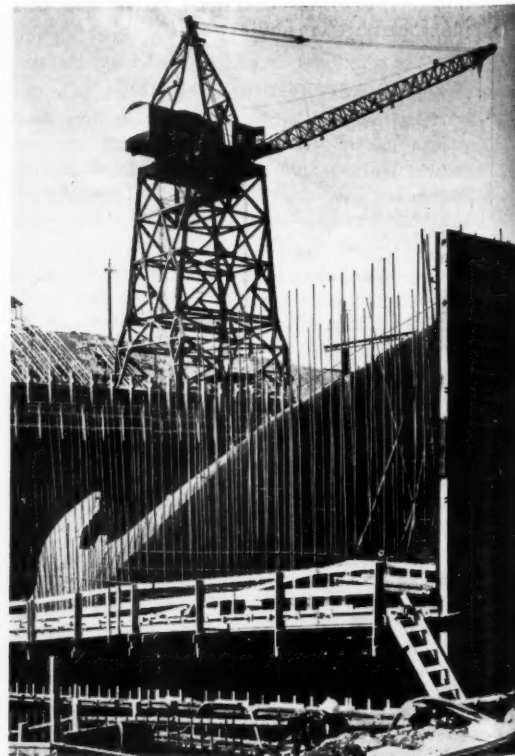


Special forms, concrete

buckets, and delivery rigs help keep concrete work on schedule for second largest power facility



One Washington gantry, left, places form panels for the draft tube piers on the side of the powerhouse, and a second gantry buckets concrete to a monolith.



Forming and reinforcing take shape for one of the draft tube piers. Blaw-Knox prefabricated steel forms are covered with plywood that can be removed or repaired.

and within a month, more than 1,500,000 cubic yards of excavation was completed.

Power plant excavation

After part of the north channel of the river had been sealed off by a 4,200-foot sheet-pile downstream cofferdam and a similar 500-foot-long upstream cofferdam, both built under a separate contract by Mannix-Raymond, Ltd., Montreal, Canada, deep well dumps were set to work to pump about 65 million gallons of water from the area. Initial excavation involved drilling and shooting the overburden of glacial till and loading out the material to Euclid 14-yard rear-dumps with 2-yard shovels. Limited use was made of a Manitowoc 4500 dragline and shovel during this operation.

With this done, drilling and grouting were started to correct foundation conditions in the bedrock. Bedrock excavation consisted of dolomite, interspersed with strata of shale, sandstone, limestone, and gypsum, and it was drilled on the structural lines by a Joy wagon drill and a line drilling bar. If excavation went from 10 to 20 feet deep, Gardner-Denver Air Trac drills were put to work. Excavated rock was stockpiled for classification and some of it was put through a Cedarapids portable crusher to be used for such things as filter blanket aggregate for the earth dikes.

Aggregate handling

To place about 450,000 cubic yards of concrete this construction season, at a rate of up to 20,000 cubic yards per week, the contractor is using an automatic concrete production setup that has been planned so that unloading of cement and aggregates, and mixing are done at peak efficiency.

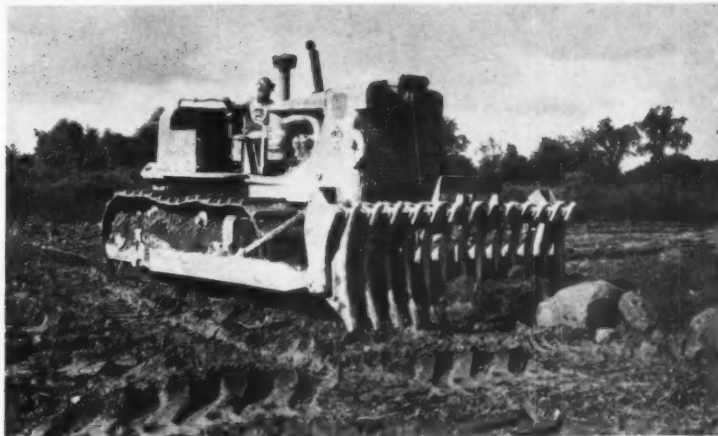
Four sizes of aggregate, together with sand, are being supplied to this project from the Norwood, N. Y., plant of Tecon Corp., under a contract with the New York State Power Authority.

Aggregate is delivered to the classification yard at the project site by the contractor's railroad crews, which operate and maintain some 15 miles of tracks and a 125-ton-capacity Alcoa locomotive. The bottom-dump railroad hopper cars unload at a double-track railroad spur, where cars are first classified so that the same size aggregate is dumped over each unloading point. Both unloading points are operated so that the same size stone is unloaded as long as possible before a switch is made to another size aggregate.

As car doors open, a Hewitt-Robins car shake-out shakes the sand or stone from the railroad cars to the hoppers beneath the track. The shake-out is operated from the overhead control room that straddles the tracks and travels on an overhead truss above the tracks.

As aggregates are unloaded, Link-Belt plate feeders bring the stone from the under-track hoppers to a short Link-Belt conveyor that feeds onto a Barber-Greene overhead conveyor system. This system, with a Barber-Greene tripper, travels along

(Continued on next page)



As fill is spread on the dike, an Allis-Chalmers HD-21 tractor makes a transverse pass with a Rockland raker to remove large boulders from the borrow material.



D-452

This type 66 Diamond plant has a shovel loading hopper equipped with a grizzly for scalping and a single eccentric plate feeder which assures continuous, regulated feeding from hopper to plant.

Diamond Portable Crushing Plants can increase your profits

It's a fairly simple matter to produce aggregate. But differences in crusher capacities—even within the same class—can make or break your profits.

Aggregate records of many companies prove that any one of the five Diamond primary and secondary crushing plants will not only out-produce other machines in its class... it regularly exceeds its own rating!

For example, Diamond's type "66" plant, with a rating of 100-125 cu. yds. per hour produced as high as 225 yards of $\frac{3}{4}$ " minus road gravel per hour in various pits. And aggregate moves faster with a Diamond. A Diamond developed rotor-lift recirculates loads at higher speed and more economically than other systems for secondary crushing.

Other Diamond primary and secondary crushing plants, rated in capacity from 30 cu. yds. to 225 cu. yds., are equally efficient aggregate producers. All feature Timken roller bearing jaw crushers and roll crushers for fast, efficient crushing.

Additional Diamond features include a positive throw vibrating screen with four Timken roller bearings; a power drive with option of flat belt, V belt or spline shaft... and many others that aid in volume production at low cost per ton.

It's easy to see why companies that base their profits on aggregate production ability, invariably order another Diamond when expanding operations. Get full details today... no obligation.

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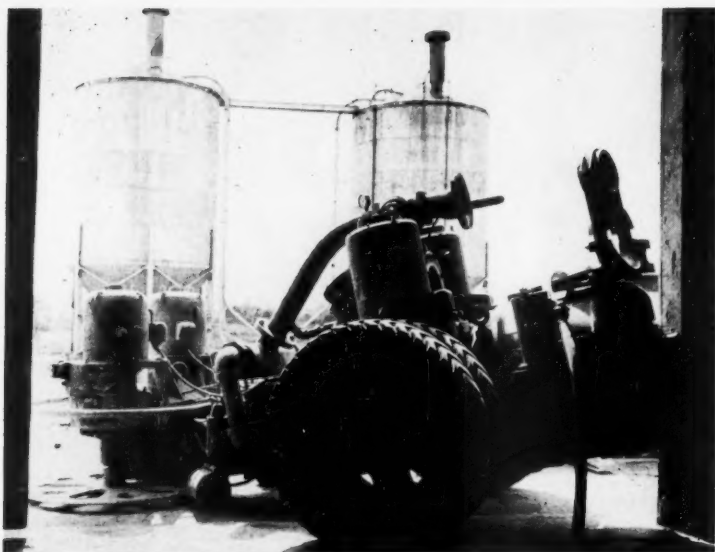
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For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 217



This Fuller-Kinyon remote-controlled air-electric cement unloader pumps portland cement from the hold of a Great Lakes steamer to the 7,500-barrel storage silos, background. A Master electric motor drives the feed worm that brings cement to the air chambers of the unloader. C&E Staff Photos

(Continued from preceding page)

trusses located over the stockpiles and is also operated from the overhead control room straddling the tracks.

The operator in the overhead control room also controls the movement of cars across the unloading hoppers by means of a Joy air winch and cable that hooks to each railroad car. The empty cars are detached and dropped down the inclined rail to the stop position. The operation permits a centralized control of unloading and minimizes delays that might otherwise occur.

Aggregates are fed from their respective stockpiles to a conveyor in an Armco Multi-Plate 108-inch reclaiming tunnel by air-operated clamshell gates or Syntron feeders. A feeder is used for 6-inch stone, and the clamshell gates are used for sand and the 3-inch, 1½-inch and ¾-inch stone.

Inside the reclaiming tunnel, the Barber-Greene 30-inch belt conveyor runs to the rinsing belt, where aggregate is washed. Sand bypasses the Allis-Chalmers shaker-screen, but the aggregates are retained to be sprayed with water at a pressure of 125 psi. This water, as well as water for cleanup and curing operations at the power plant site, is supplied from the St. Lawrence River by Worthington deep-well pumps.

After the aggregate has passed through the rinsing screen, it continues up the main conveyor to the rescreening plant, consisting of a Tel-smith double-deck screen at the top of the plant's aggregate bin. The head tower operator, who controls the opening and the closing of the tunnel gates and feeders and the operation of the rinsing screen, bypasses sand directly to its compartment. The aggregate is separated according to size and delivered to separate compartments. The production of concrete is on so tight a schedule on this job that the contractor replaces the screens in the Tel-smith every five weeks, or before the screens can wear out. This keeps the plant operative and eliminates delays.

Handling cement

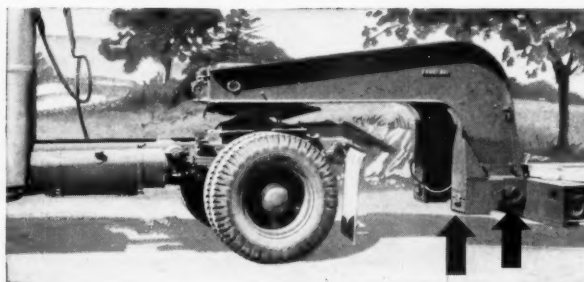
A third track, parallel to the double-track spur, is used to unload natural cement delivered from American mills. A Fuller-Kinyon air system delivers the unloaded cement to the 2,500-barrel natural cement silo. A connection makes it possible for this system to deliver the cement, via air slides, from the silo to the natural cement silo atop the Johnson batch plant.

The method of delivering portland cement is one of the more unusual features of the batching setup. Bulk portland cement from the mill at Quebec city, Quebec, is transported along the St. Lawrence Seaway by a lake cargo carrier to a dock located at an enlarged section of the existing Cornwall Canal. The carrier has a

draft of about 14 feet and handles a tonnage equal to 15,000 barrels of cement. The Cornwall Canal, 14 feet deep, bypasses the International Rapids at Long Sault on the St. Lawrence.

After the steamer ties up at the dock and the hatch covers have been removed, Fuller-Kinyon remote-controlled air-electric pumps are lifted from the dock and lowered into the forward and rear holds of the lake cargo carrier. Both pumps suck cement from the hold of the steamer and deliver it to each of the 7,500-barrel storage silos nearby via an 8-inch steel pipe. Low pressure air, from Fuller-Kinyon compressors driven by General Electric motors, is supplied to the Fuller-Kinyon pumps from a compressor house adjacent to the

Bigger ROADBUILDING PROFITS!



NO WINCH REQUIRED . . . Carryall is uncoupled and dropped, pins and block (see arrows) attaching gooseneck to platform are removed and gooseneck is simply re-coupled and pulled away.



RE-COUPING ON SLOPES . . . Either uphill or downhill slopes cause no inconvenience in re-connecting the gooseneck and Trailer. Winchless units are available with capacities up to 50 tons.

dock. A mercury relay switch wand, operating through remote control, maneuvers the Fuller-Kinyon pumps along the hold of the steamer for the 24 hours required for unloading.

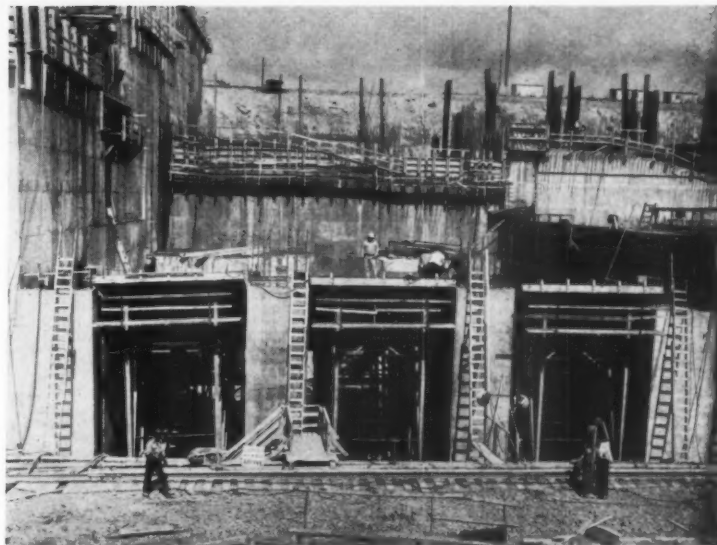
The loss of cement from the Fuller-Kinyon system is held to a minimum by a Pangborn dust collector that connects the silos through a common outlet. Bags inside the dust collector are checked every four hours, and trapped cement falls into the silo.

When it is needed, the portland cement passes from the silos via air slides to either one or both of the Fuller-Kinyon 7-inch pumps that deliver the material through a 10-inch pipeline, 3,000 feet long, that leads to either of the two silos adjacent to the concrete plant on the U. S. side of the river. Air for these Fuller-Kinyon

pumps is supplied by low-pressure Fuller-Kinyon air compressors, located in the compressor house, that are driven by General Electric 200-hp motors.

The two Johnson 7,500-barrel silos on the American side of the river, also equipped with Pangborn cement reclaimers, have the cement handled through air slides to a bucket elevator that brings the material to the portland cement bin atop the Johnson mixing plant. In emergency, the portland cement can bypass the bucket elevator, through the Fuller-Kinyon natural cement air system. This operation can only be done under the supervision of the shift superintendent.

The electrically-controlled batch plant is operated from the usual panel



A traveling Blaw-Knox steel form for the roof of the generating-unit draft tube is made ready for a pour. The form is supported by the two 7-foot-wide intermediate piers and the 15-foot-wide main piers that form the outside walls of the draft tube.

board as aggregate and cement are delivered through the dry batchers to one of the four Koehring 4-yard tilting type mixers. The weights of ingredients making up a 4-yard batch of 6-inch exterior concrete are:

Portland cement	1,144 pounds
Natural cement	360 pounds
¾-inch stone	2,536 pounds
1½-inch stone	1,960 pounds
3-inch stone	2,880 pounds
6-inch stone	4,148 pounds
Water	708 pounds
Admixture (Protex)	1,280 grams

Concrete transport

Since the contractor on the American part is placing half the 1,900,000 cubic yards of concrete required, together with about 18,000 tons of reinforcing steel, special concrete-hauling rigs and special buckets are being used to speed the work.

The combination haul rigs consist of eight Euclid rear-dumps, each having its body replaced with a shop-designed frame holding two Koehring 4-yard Dumptor bodies, which bring concrete from the mix plant to an unloading dock near the four Washington gantries that place the concrete. A 20-cfm air compressor, mounted on the truck frame and operated from the power takeoff, gives a pneumatic action to the dumping of the Koehring Dumptor bodies and retracts the body to its original position. The Euclids are kept from overturning during the dumping operation by counterweights and a 4-inch diameter pipe that is trailed along one side. The Dumptor drops the concrete at right angles to the center line of the Euclid into the waiting bucket.

The buckets used are also modified, being Gar-Bro 6-yard buckets that take a 4-yard load. They remain hooked to the gantry while concrete is transferred. Permanent elephant trunks and hoppers that fold beneath cages attached to the bottoms of the buckets make it unnecessary for either hoppers or elephant trunks to be removed while buckets are being filled.

(Continued on page 30)

NEW Winchless Removable Gooseneck Fruehauf Carryalls Cut Loading And Unloading Time In Half For Roadbuilders Hauling Heavy Machinery!

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For hauls suited to stationary gooseneck carryalls Fruehauf builds a complete, rugged line of both single and double drop units, from lightweight 15-ton-capacity carryalls up to the massive 100-ton unit.

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LOADING IN NARROW AREAS . . . Wide, level tracts of land are not required for the loading or unloading with removable gooseneck unit. Huge cranes move quickly on from the front.

How many yards per hour?



PAYLOADER® “more yardage” features

Balanced four-wheel-drive, torque-converter and exclusive power-transfer differentials give more effective traction on mud, gravel, ice and snow for more reliable crowding power. Coupled with this crowding power is the unusual pry-out action and 40° tip-back of the bucket at ground level to get full bucket loads with less spillage. The result is that a “PAYLOADER” can

The 40° tip-back of the bucket at ground level permits a carry position that is close and low for maximum stability and with bucket opening almost level to prevent spillage of heaped loads. Hydraulic system shock absorber cushions the loaded bucket while carrying, smooths the ride and allows higher carrying speeds with less spillage. These features enable a “PAYLOADER” to

It's the yards delivered that count on a job and that's where a “PAYLOADER” really pays off. It gets more load in the bucket with less spillage to begin with — it can carry at higher speeds with less spillage — it can maneuver faster because the power-shift transmission requires no stopping for ANY shift. All these advantages enable “PAYLOADER” tractor-shovels

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More yards on any job!



No one knows better than you that a rubber-tired tractor-shovel can do so many jobs, under so many kinds of job conditions, that the yardage handled can vary considerably. That's why yardage figures can be so misleading unless all the factors are taken into consideration . . . kind of material . . . whether in-place or re-handling . . . operator efficiency . . . length of haul . . . waiting time for trucks . . . one location or scattered jobs, and many other variables that affect daily output.

But of this you can be certain . . . on any given job the new "PAYLOADER" tractor-shovels will deliver more yards per day than

any comparable size tractor-shovel . . . and will do so continuously shift after shift.

The knowledge and experience gained in building thousands of tractor-shovels over the past 30 years is your assurance that a "PAYLOADER" is superior in design, engineering and performance . . . that it will outperform and outproduce any other comparable unit on any job.

So don't be deceived by "box-car" yardage figures . . . take a close look at the "PAYLOADER" . . . on *your* job . . . and you be the judge. Your "PAYLOADER" distributor will be happy to arrange a demonstration at your convenience.

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Fill for the 8,500-foot-long dike connected to the forebay training wall is delivered by a Euclid 18-yard bottom-dump. A Caterpillar D9 tractor with bulldozer waits to spread the material.

C&E Staff Photos

FASTER COMPACTION at less cost!

COMPACTION ROLLER SAVES TIME, MONEY ON BIG EARTH-FILL DAM JOB IN ARIZONA

When Fredericksen & Kasler, contractors of Sacramento, Calif., were awarded a Corps of Engineers contract to build the new 9-mile Trilby Wash Detention Basin at Beardsley, Ariz., they used a Southwest 50-ton pneumatic roller to speed up operations and to cut compaction costs.

Construction of the big earth-fill structure—designed to protect nearby Luke Air Force Base from flash floods—started in July, 1955. When the job was finished a year later, about 3,000,000 cubic yards of yellowish-red clay, silt and light caliche had been moved.

Congestion Problem

Physical dimensions of the dams were so limited in cross-section that equipment congestion on the fill threatened to be a serious problem. The dam is only 100 feet wide at its base, 25 feet high, and tops out with a crest width of only 12 feet. The contractors had to move the dirt in fast because earthwork represented nearly 70% of the total contract. An added complication was that specifications required 95% Standard AASHO compaction and moisture at 100% of optimum.

Superiority Recognized

However, the specifications gave recognition to the superiority of the heavy pneumatic roller as a compaction tool. They provided that 12-inch lifts of dirt could be placed at optimum moisture and that either eight passes of a heavy-duty sheepfoot or only four passes of a 50-ton pneumatic would be satisfactory.

The contractors used a Southwest C-50 for the principal reason that it would handle a normal daily input of 20,000 cubic yards (9 hours) without

cluttering up the fill. As a speed-up measure the method of dumping was modified so that 6-inch lifts were placed, with the roller making two passes. Because of the full-oscillating feature of the four weight boxes on the C-50, the tires reach down and search out all the uncompacted spots.

Exceeds Required Densities

With 75% of the dirt work in, a life average for the project showed that average densities of 96.1 had been obtained. This was 1½ percentage points higher than had been required.

The C-50 was able to handle 20,000 cubic yards a day—and up to 30,000—without the use of auxiliary equipment for fill leveling. The contractors put the moisture content in the material in the borrow pit by sprinkler irrigation, followed by a week-long period of draining before loading and hauling in material.

Congestion Eliminated

Congestion was eliminated completely. The only compacting equipment on the fill besides the C-50 were two double sets of Southwest sheepfoot rollers which did not serve in a primary capacity.

Sections 1,000 to 4,000 feet long were worked at one time. Even as the dam crested out at the top, no special concessions had to be given the C-50. It was able to travel just as fast as the hauling units which brought in the dirt. Elimination of the fill congestion problem put

The four Washington cranes on this job—two upstream and two downstream from the powerhouse—each have a cab equipped with a 20-cfm air compressor with a ¾-inch air hose that runs the length of the 150-foot boom. Maintained at proper tension by a Rud-O-Matic tagline, the hose is attached to the air chamber of the Gar-Bro bucket. Air does not have to be supplied from an outside source to dump the buckets; a pull chain is all that is needed to release the concrete.

The water distribution system, used for cleaning and curing the concrete foundations, parallels the air distribution system at the site. Compressors at the compressor house at the top of the dam—including seven Joy

750-cfm units, each driven by a 150-hp Commonwealth induction motor—deliver air through feeder lines to vertical risers spaced about every 80 feet in the monolith lifts before concrete is placed. The 2-inch diameter riser for air and the 2-inch diameter riser for water at each location makes it possible for green concrete to be cut and cleaned between the usual 5-foot lifts. When the project is completed, the risers will be grouted and recessed in places where air and water will no longer be needed.

Steel forms

Steel forms are being used wherever possible to make the concrete operations fast and efficient. Because of the size of the job and its tight schedule, however, two different turbine manufacturers are each furnishing eight turbines for the American half of the project. Because of minor design differences in the turbines, two sets of forms are being used for the draft tubes. Both sets, supplied by Blaw-Knox, will provide the variation required by the eight Allis-Chalmers turbines and the eight Baldwin-Lima-Hamilton turbines. The scroll case and intake forms will also be used eight times to provide for the differences in the turbine requirements.

The draft tubes, about 97 feet long, have a diameter of about 24 feet at the throat. Their depth, from throat to elbow, is about 30 feet. The two intermediate piers are 13½ feet high and 59 feet wide, while the discharge end of the roof is about 24 feet above the piers. The tube opening is 60 feet wide.

In forming the draft tubes, the contractor is placing concrete in the contoured floor slab first. At a later date, after the pier noses and the draft tube gate guides have been placed, the 7-foot-thick intermediate piers are poured. Concrete is then placed in the 15-foot-wide main piers which, spaced 80 feet apart, form the inner walls of the draft tube. After forms have been removed, a Blaw-Knox steel traveling roof form is used as concrete is placed to the spring line of roof. These forms are lagged with 2-inch strips of wood and have skin plates consisting of plywood that can be removed or repaired after each pour has been made. The draft tube roofs must be cured for at least 10 days before forms are removed.

As concrete is placed for the monoliths, it is consolidated by Malan air-operated vibrators. Though Hunt Clear Cure is used whenever possible, it does not preclude the use of water for curing in many places.

Wood forms being used for more intricate concrete work are being fabricated at the site's carpenter shop, which is equipped with such tools as two Delta radial saws, a Delta work bench, a Delta joiner, and many hand power tools. Material from the storage yard moves by conveyor to the carpenter shop, where it is cut in accordance with the design for a particular form then passed out to a platform for fabrication.

All during the concrete work, the



Single Southwest C-50 Compaction Roller compacted 6-inch lifts in two passes to meet required 95% Standard AASHO density.



Use of sheepfoot roller was incidental to building Trilby Wash Detention Basin.



DW-21 towing Southwest C-50 Roller.



Southwest C-50 eliminated congestion problem by handling 20,000-30,000 cubic yards a day.

compaction out in front on a safe, profitable basis.

Southwest Heavy Duty Compaction Rollers can be teamed with all crawler type tractors and nearly all wheel type, off-the-highway tractors. Southwest Rollers range in size from 15 to 100 tons.

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job site is being dewatered continually by small gathering pumps that discharge water to a trench that is kept pumped out by a type-K Morris sand-dredge electric-powered pump. Electric power is furnished to the contractor's substation from the local power supply and is distributed throughout the job over the contractor's distribution system.

While concrete operations are in progress, the contractor is excavating for the switchyard and placing borrow material for the 8,500-foot-long dike that will connect to the forebay training wall. The deepest fill in the dike is 45 feet. The more than a million yards of borrow for this dike is being excavated by 2½-yard shovels and a Marion 111-M dragline and loaded to 16 Euclid 18-yard bottom-dumps. Four Caterpillar D9's are spreading the fill and doing incidental work in the borrow pit and at other points. Eight Allis-Chalmers HD-21's also working the dike area, either pull LeTourneau-Westinghouse 3-foot rollers or remove boulders from the fill with Rockland raker attachments.

All the short cuts being used on the powerhouse will, it is expected, help the contractor to complete the American half of the structure within the contract time—December 30, 1959. During 1958, curtain grouting will be completed. This includes holes drilled from the inspection gallery through 4-inch pipes being embedded in the monoliths inside the inspection gallery. These holes will be drilled 30 to 120 feet into bedrock and will be pressure-tested and pressure-grouted.

The schedule calls for the cofferdam to be removed from the downstream side on or before July 1, 1958, when other work is also to be completed that will permit the pool to be raised. At this time too, permanent trash racks, stop logs, and vertical lift gates will have to be positioned on the upstream side of the facility. Three permanent gantry cranes will also be positioned on the powerhouse deck to handle the lifts. One, with a capacity of 350 tons, will handle work on the generators and turbines. The 105-ton-capacity gantry will move along the upstream edge of the powerhouse to handle the stop logs and gates. A third 30-ton gantry will handle downstream stop logs that will close the draft tubes so that unwatering can be done in the turbine or generator pits.

Personnel

Upwards of 1,300 men are being used by the contractor on this project, which has Albert R. Berry as project manager, Harry Evans as general superintendent, Einar Skinnarland as project engineer, Richard Toohey as swing shift superintendent, and Floyd Graves as graveyard superintendent.

Uhl, Hall & Rich, Boston, Mass., the consulting engineering firm for the New York State Power Authority, has Frank Matejka as project manager, with over-all supervision of all the power facilities being constructed by the Power Authority. His staff includes Ellis Armstrong, assistant project manager, and Thomas J. Laskow-



One of four Caterpillar D9's levels material for the forebay training wall dike. This dike requires more than a million cubic yards of fill material.

ski, the safety director who plays an important part in setting up the procedures to be followed by all the contractors on the power projects. Resident engineer William Latham represents the Power Authority on the powerhouse project. **THE END**

Clark president honored

George Spatta, president of the Clark Equipment Co., Buchanan, Mich., was presented with a citation by the Cooper Union for his outstanding achievements in the manufacturing of roadbuilding and material handling equipment. The citation was made at the Alumni Gathering Banquet at the Hotel Statler in New York on October 6.

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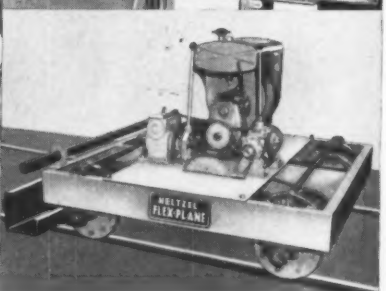
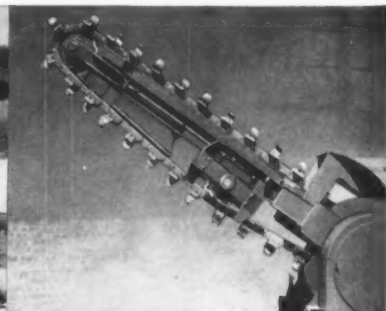
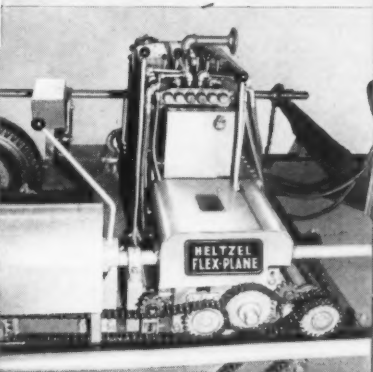
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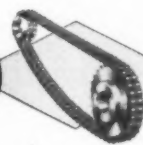
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Grass River Lock

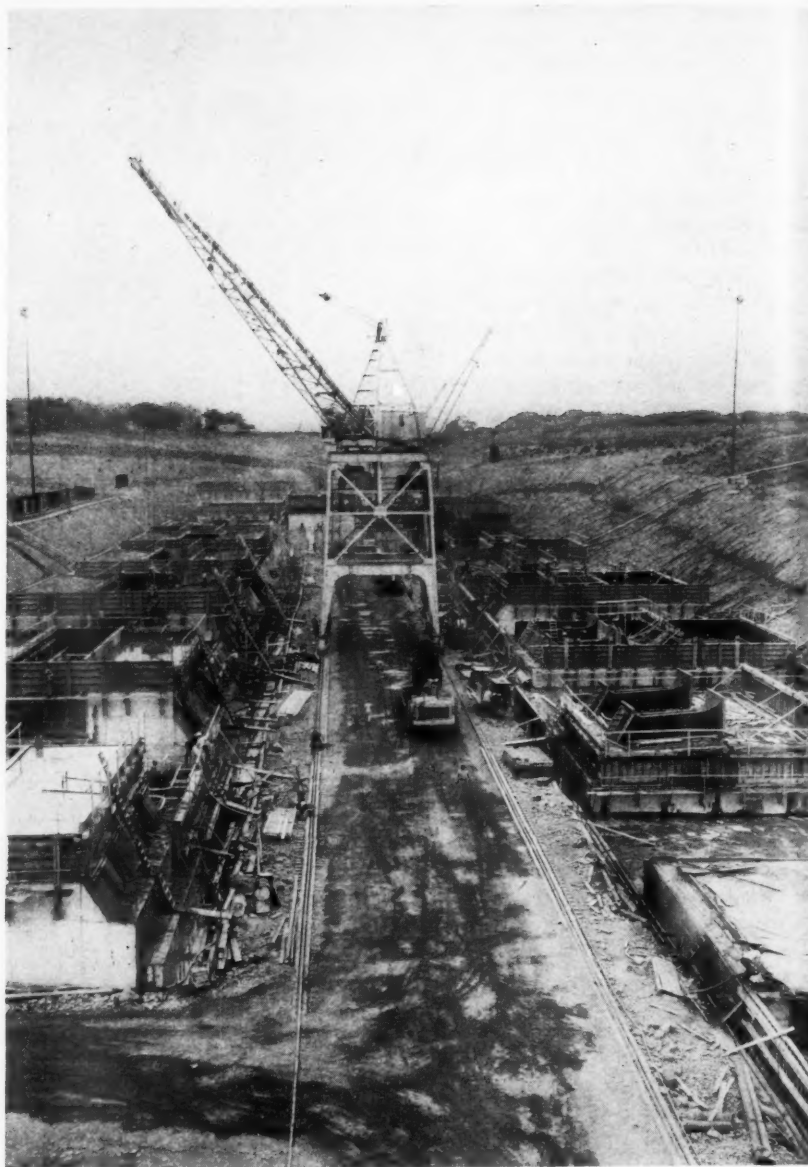
**Short cuts in aggregate, concrete handling,
hurry work on lock; lower guide wall is to be
built on sheet-piling cell foundation**

(Additional photo on front cover)



A Rogers low-bed trailer carries two Blaw-Knox concrete buckets as it is hauled to the lock by a Euclid tractor. A crane will swing an empty bucket to the third slot on the trailer before picking up a full bucket.

C&E Staff Photos



Working between the rising walls of the lock, a Washington gantry with 150-foot boom swings concrete from the Euclid-Rogers hauling rig to a monolith pour.



Concrete is placed for one of the 5-foot monolith lifts by one of the rail-mounted Washington gantries. Air and water are supplied to this side of the lock by the Naylor Spiralweld pipeline, lower right.



Workman attaches pneumatic lines to air-operated Blaw-Knox 4-yard concrete bucket to activate bucket gate. Concrete is placed in Blaw-Knox prefabricated steel forms used for the 5-foot lifts.

The two locks being built in the new 10-mile Long Sault Canal, which is still being excavated, are basically the same. Both, with a maximum lift of 49 feet, will permit vessels to be raised and lowered to and from the ultimate pool created by the Barnhart Powerhouse and Long Sault Dam. The difference between the upper and lower pool elevations created by the power projects is about 90 feet.

The biggest difference between the two locks is in their method of construction. The crane-and-bucket method is being used to place concrete for the Dwight D. Eisenhower lock, located upstream, which will have a roadway built through it to provide access to what will become the St. Lawrence State Park on Barnhart Island.

Another technique is in use on the \$26,753,000 Grass River Lock, located at the downstream tip of the canal. Here, gantry cranes are being employed by Grass River Lock constructors, consisting of Perini, Walsh, Morrison-Knudsen, Kiewit, and Utah companies, with B. Perini & Sons, Inc., Framingham, Mass., as sponsor. With this method, the joint venture is placing up to 3,000 cubic yards of concrete for the lock every 24 hours.

Simultaneous operations

Excavation for the Grass River Lock, at the downstream tip of the 10-mile Long Sault Canal, was completed in March under a separate contract by Dutcher Construction Co., Baltimore, Md. This excavation, going to a depth of 115 feet, is at the intersection of the Grass River and the south channel of the St. Lawrence, and is kept dry by an earth plug a few hundred feet long downstream from the lock site.

Remaining earthwork is being done simultaneously with concrete operation and is geared so that both will be completed at the same time. Altogether, 1,200,000 cubic yards of earth and 40,000 yards of rock are being removed in a 200-foot stretch downstream from the lock and a 300-foot stretch upstream from the lock so that the facility can be tied into the Long Sault Canal upstream and the St. Lawrence River downstream. In addition, about 2,800,000 cubic yards of borrow material is required for road construction and for back-filling the lock walls.

Excavation on either end of the lock is being done by ten Euclid 15-yard rear-dumps; six Euclid 15-yard bottom-dumps; and six Euclid 15-yard scrapers, which haul to spoil areas near the site. These rigs are loaded at the upstream area by a Manitowoc 4500 crane with 120-foot boom and a 3½-yard dragline bucket. A NW 80-D, a Lorain 2-yard shovel, and a Marion 111 crane with 3-yard dragline bucket load the Euclids at the downstream end of the lock. A fleet of tractor-dozers, consisting of

(Continued on next page)

At the downstream end of the lock, an Allis-Chalmers HD-21 tractor bulldozes blasted rock to a pile so that it can be picked up by the Hough Payloader and loaded on a dump truck. Excavation here, and at the upstream end, is being made to tie the lock into Long Sault Canal.



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An International truck pulling water-tank trailer drives up the earth-fill unloading ramp used to dump aggregate to the unloading hopper.

C&E Staff Photos



(Continued from preceding page)

five Allis-Chalmers HD-21's, two Caterpillar D9's, and four Cat D8's, is used to push-load scrapers, maintain haul roads, assist shovels, and maintain spoil areas.

Concrete placement

While this earthwork was going on this season, concrete work kept moving night and day so that as much concrete as possible could be placed.

Concrete is brought to the lock by five Euclid tractors that pull Rogers low-bed trailers capable of carrying three Blaw-Knox 4-yard concrete buckets. As a rig arrives at the lock with full buckets, a crane swings an empty into the third slot on the trailer and picks up a full bucket. When this is returned and the second full bucket picked up, the concrete-hauling rig takes off for the batch plant to have the two empties refilled.

Two Washington gantries, with 120-foot booms, ride rails between the lock walls as they place concrete with the air-operated buckets. Both are fed with electric power from a substation adjacent to the compressor house. This substation also supplies power for the mercury-vapor lamps atop the light towers for night operations.

The Manitowoc 4500 crane, powered by a Caterpillar diesel, and with a 140-foot boom, handles such pours as those for the miter sills at either end of the lock. This crane has an air-operated Gar-Bro concrete bucket hook, supplied with air by a compressor mounted on top of the cab.

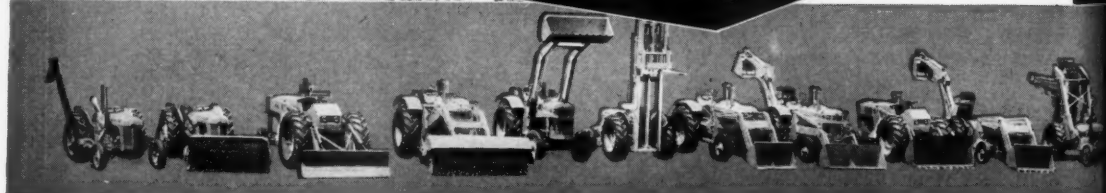
The two side walls, 50 feet wide at the base, will be 115 feet high above bedrock when the lock is completed. They are about 1,220 feet long. This will provide enough distance between the upstream and downstream miter gate sills and the downstream diffuser block, and will leave an 800-foot-long, 80-foot-wide lock chamber between the sills and walls.

The maximum and minimum monolith pours, 700 and 200 cubic yards, respectively, are made in 5-foot lifts averaging about 50 feet long. Most of the flat-surface pours are being made with Blaw-Knox steel forms. Remaining formwork, fabricated in the job contractor shop, is being used for the filling and emptying culverts and

their many feeder culverts, and for the pool regulation culverts. These forms are faced with 1/4-inch plywood and backed with 1x6-inch and 1x8-inch ship-lap boards with 2x6-inch studs and 3x6-inch walers tied with Williams tie bolts. Studs are spaced on 12-inch centers. The plywood facing is replaced, on an average, after forming has been used for three pours.

Air, which is used with water to green-cut the surface of the monolith pours and is required by the Malan vibrators consolidating the concrete, is supplied from a central compressor bank consisting of four Joy Model WN 102 720-cfm air compressors. These are driven by a Westinghouse, a Commonwealth, and two Reliance electric motors. An 8-inch Naylor Spiralweld line feeds the air to the

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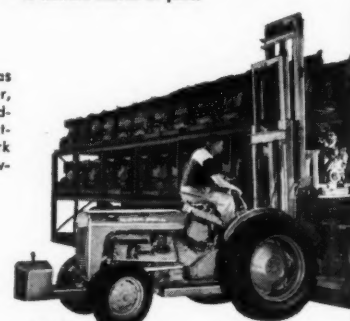
and attachments. Five tractors (34 to 52 hp) with choice of 20 attachments — loaders, hoes, blades, mowers, trenchers, augers, fork lifts, and others — to handle scores of jobs.



42-HP DAVIS PIT BULL handles either 3/4 or 1 1/2-yd buckets. Frequently outperforms bigger, more costly shovel-loaders because of overall advanced design, which includes torque converter and "foot-shift" reversing clutches as standard equipment.



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LOW-COST, VERSATILE Model 202 Fork Lift loads equipment and machinery, stockpiles building materials, also handles blade or utility buckets. Economical-to-operate 34-hp engine makes great for utility and cleanup on big spreads... ideal for small, scattered, work-and-run jobs.

lock site. All pours are water-cured for 72 hours before forms are stripped and the concrete green-cut for the following lift.

Guide walls

Two guide walls, extending upstream and downstream from the north wall of the lock, will be about 1,600 feet long. The upstream guide wall, which will curve about 210 feet out from the axis of the north wall, will consist of a typical concrete gravity-type structure, 45 feet high, 32 feet wide at the base, and 6 feet wide at the top. This wall will be supported by the 60 feet of glacial till that lies above bedrock.

Because of the absence of adequate foundation fill material, the lower guide wall will be constructed on a

sheet-piling cell foundation.

About 8,220,000 pounds of plain interlocking sheet piling, 42 feet long, will be driven through marine clay to rock to form four 12x16-foot cells at either end of the guide wall. About 77 intermediate cells, measuring 14x52 feet, will be driven between these end cells. Then vertical and battered H-piles, 45 feet long, will be driven within the cells and cut off at an elevation equal to that of the top of the cells. Cells will be capped with a 20-foot-thick, 54-foot-wide concrete wall. Altogether, about 2,495,000 pounds of 12-inch 53-pound H-pile sections will be used in the cells. Two 165-foot-long guardrails, at either end of the south lock wall, will be concrete gravity structures similar to the upstream guide wall.



As aggregate is dumped from Omaha Standard trailers to the hopper, which is equipped with a Johnson cobble gate, it goes to a Barber-Greene conveyor belt feeding the stockpiles.

Batching operations

About 500,000 cubic yards of concrete, which will be required before the lock is completed in December, 1957, is being turned out at the site by an automatic batch plant at a rate of about 2,600 cubic yards daily. This huge plant, which was used for six years at the Jim Woodruff Dam project on the Chattahoochee River near Florida, is supported by a cluster of six H-piles driven 50 to 70 feet into the ground under each column support. The clusters were then capped with concrete and tied together with concrete connecting beams. Armco corrugated sheeting encloses the entire plant, protecting it against severe winter weather.

This plant is being supplied with four sizes of stone, plus sand, at a rate of 16,000 tons a day—or a thousand tons per hour—by the Lambert, Mills & Gorman quarry near Helena, N. Y. DeWitt Trucking Co., Pavilion, N. Y., is delivering the aggregates in Omaha Standard 20-ton belly-dump trailers pulled by International trucks. Reaching the job site, the trucks roll up an earth-fill ramp and, after the trailers dump their loads into a contractor-built unloading hopper equipped with a 24x32-foot Johnson cobble gate, drive down another earth ramp on the opposite side of the hopper.

Aggregates are picked up from the unloading hopper by a Barber-Greene 30-inch belt on a Link-Belt stockpiling conveyor. A Link-Belt tripper rides along the overhead conveyor to dump stone and sand to the proper stockpiles.

Reclaiming aggregates

A 9-foot-diameter, 400-foot-long reclaiming tunnel, made of Armco corrugated plates, operates under the stockpiles. Twelve Johnson reclaiming tunnel gates—three under each of the sand and 6-inch stockpiles, and two under each of the ¾, 1½, and 3-inch stockpiles—are operated by solenoids and controlled from the batch plant. These discharge onto a Barber-Greene conveyor in the reclaiming tunnel.

This conveyor end-dumps aggregates into a washer-shaker setup so that fines can be removed. It consists of a Telsmith double-deck 5x12 vibrating screen, the top deck having 1½-inch-square openings, the bottom deck ¾-inch-square openings. Water for this operation is supplied from a 30,000-gallon storage tank that is kept

packages!

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A Barber-Greene 30-inch conveyor belt is transferring aggregate from the washer-shaker to the Telsmith rescreens at the top of the Johnson batch plant, which is enclosed with Armco sheeting. The trailer truck is unloading cement.

C&E Staff Photos

full by a pumping station at the river. A booster pump, driven by a Chrysler engine, feeds the washer-shaker through a Naylor Spiralweld 6-inch-diameter pipeline. Nozzles above and below the two screens spray water on the aggregates passing over and through the screens.

All material passing the bottom screen is caught with water in a tub that feeds a discharge line emptying into a drainage ditch. Stone passing over the two screens is caught on another Barber-Greene belt riding a Link-Belt conveyor to the rescreens atop the batch plant. Sand, bypassing the washer-shaker, continues directly to the batch plant.

The rescreens, located on top of the Johnson 750-cubic-yard capacity aggregate bin, consist of two 5x14 double-deck Telsmith vibrating screens, each succeeding screen having a smaller size opening. Stone running off the top 3½-inch screen is classified 6-inch; aggregate from the 1½-inch screen, 3-inch; that from the ¾-inch screen, 1½-inch; and stone from the ½-inch screen, ¾-inch. All is deposited through separate chutes into separate compartments in the Johnson bin. Sand, again bypassed at the rescreens, goes through a flap gate and chute into one of the five compartments. Material passing the ½-inch screen is caught in a water bath and flushed through a pipeline into the drainage ditch.

The top 3½-inch Telsmith screen is replaced after about 46,000 tons of rock have been handled. The ½-inch screen handles 60,000 tons of rock before it is replaced. This makes it possible for the contractor to maintain an uninterrupted production schedule and helps guard against breakdowns.

Cement handling

Johnson 4,200, 5,000, and 500-barrel silos at the batch plant, together with two 5,000-barrel silos and a 400-barrel silo at the cement-unloading site, provide a total storage capacity of more than 20,000 barrels.

Portland cement is delivered to the

unloading point by 100-barrel tank trucks that dump into 50-barrel unloading hoppers. Cement is then fed through a Johnson screw conveyor, picked up by a 100-foot-high enclosed bucket elevator, and deposited in one of the three storage silos.

A similar procedure is followed after cement is hauled five miles to the batch plant silos by 100-barrel tanker trucks. Here, cement is also dumped into hoppers to go through a screw conveyor and up an enclosed elevator to the 500-barrel silo at the center of the aggregate bin. This silo feeds directly to a cement batcher. The plant has a separate batcher for each ingredient in the various bin compartments. These Johnson batchers are connected by pull wires to scales located in the control room. The opera-

tor presses a button to open the gates under each bin compartment, and sand, aggregate, and cement fall into the batchers. When the correct quantities of each ingredient have been deposited in the batchers, this operation stops automatically. The operator then presses another button on the control board, opening the batcher gates and allowing the ingredients to fall through a swivel chute and into any one of the three Koehring 4-yard tilting-type mixers. The weight of each ingredient, including the water, the type of mix, and the time of release is recorded on a Johnson strip tape recorder in the control room.

After the 2½-minute mixing cycle, the mixer tilts automatically and dumps to a wet batch hopper that loads the 4-cubic-yard buckets on the

GRAVITY dumps the load...INE





Reclaimed aggregates ride this Barber-Greene 30-inch belt to the Telsmith double-deck vibrating screen, which is being used as a washer-shaker to remove the fines from the aggregate. Sand is bypassed to the batch plant.

trailer that hauls the concrete to the gantries. As a dispatcher dumps a batch by means of an air-operated release, he tells the driver the type of mix that has been loaded out and the destination of the concrete. A weight breakdown of a 4-yard batch of 6-inch interior concrete contains;

Portland cement	846 pounds
Natural cement	282 pounds
Sand	3,649 pounds
¾-inch stone	2,576 pounds
1½-inch stone	2,221 pounds
3-inch stone	2,699 pounds
6-inch stone	4,228 pounds
Water	701 pounds
Admix (AEA)	800 grams

Safety

This project, like others in the Seaway development program, has a job-site first-aid headquarters. Unlike the others, its headquarters is located in a mobile Smithco office trailer rather than in fabricated wooden buildings. The converted trailer is equipped with a cot, cabinets, first-aid supplies, and files for reports. A registered nurse is always on duty in the trailer; a Cadillac ambulance, standing next to the trailer, is used to take serious accident cases to Massena Memorial Hospital. Time lost due to accidents, however, has been kept to a minimum on this project, largely because the importance of observing safety procedures is impressed constantly on the men.

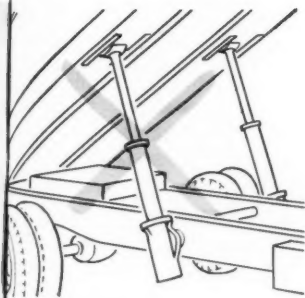
Personnel

Robert K. Ames is the project manager, George Margerum the project engineer, and Lowell Cooper the general superintendent for the Grass River Lock Constructors, which employs more than 1,000 men for its round-the-clock operations. Clyde Ulery is the plant superintendent and James Reagan the safety engineer for the contractor. Reagan and Alfred Perini, Jr., the assistant safety engineer, constantly inspect the activities at the lock to detect and correct any safety violations.

John Hayes is the resident engineer on the job for the Buffalo District, U. S. Army Corps of Engineers, the contracting and design agency of the St. Lawrence Seaway Development Corp., which has Lewis G. Castle as administrator. Col. Loren W. Olmstead is the district engineer and Thomas F. Airis, the area engineer at Massena for the Buffalo District.

THE END

INE second



Koehring Dumptor® no body hoist

Operator drives up, trips the release lever — and gravity tilts 6-yard body 70 degrees. One second later the load is out, and Dumptor is on its way back for the next. It's as simple and fast as that!

There's no 15 to 25-second wait for retracting body hoists — no expensive hoist replacement parts, maintenance or down-time. And, you get same one-second dumping every day, under heaviest loads, in all temperature extremes, because Koehring gravity-dump never balks — it wears out.

One-second dumping earns a substantial increase in yardage output, too. For example — take a typical 1,000-yard haul where you would normally make 16 trips an hour. By saving an average of 20 seconds dump-time on every trip, Dumptor gains 320 seconds, or 5.3 minutes more productive time per hour. You get 17½ trips, instead of 16. This, alone, adds 10% to hourly production.

Time saving is typical of Koehring Dumptor's basic principle — to reclaim all non-productive time to a maximum — to increase work-time to more yards per day. See Koehring Distributor for complete information.



Saves 20 seconds every time it dumps — Heaviest loads are dumped instantly. Tilting Dumptor body rolls on heavy-duty rockers. Snub chains attached to big shock absorbers check the body at approximately 70-degree tilt.



Shuttles back and forth without turning — Dumptor operates with equal ease in either direction. Constant-mesh transmission gives the same 3 travel speeds forward and reverse. Every turn eliminated cuts 15 seconds off cycle time.



64 square-foot loading target — Big, square body opening permits loading over either end or sides. Top edge and bottom are box-beam constructed. Sides, ends, heavily rib-reinforced. ½"-thick kick-out pan bolts to floor for rock work.

Four diamond blades for sawing concrete

■ Four new concrete-cutting diamond blades have been developed by the Clipper Mfg. Co., two for cutting old concrete and two for sawing green concrete.

The CD-68-3 and the CD-78-3 are made with a ⅞-inch width and a 3/16-inch diamond depth for cutting old concrete. The first blade is recommended for concrete containing medium-hard aggregates. The latter is recommended for concrete with favorable aggregates and for asphalt. When used on concrete, the CD-78-3 should be driven by a saw with 25 horsepower or more.

The CD-69-3 and the CD-79-3 are made with a width of 9/64 inch and a diamond depth of 3/16 inch. The former is recommended for sawing green concrete with medium-to-hard aggregates, though it can be used on all types of aggregates. The latter is recommended for green concrete with medium-type aggregates.

For further information write to the Clipper Mfg. Co., 2800 Warwick, Kansas City, Mo., or use the Request Card at page 18. Circle No. 103.

KOEHRING COMPANY

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Names in the news

Intrusion-Prepakt names H. H. Roberts manager

Intrusion-Prepakt, Inc., Cleveland, Ohio, specialists in concrete construction and foundation stabilization, has named Harrison H. Roberts manager of engineering and foreign operations.

Mr. Roberts for the past two years has been chief engineer for Walsh Canadian Construction Co., constructing a 7 million-cubic-yard excavation contract for the St. Lawrence Seaway Authority. Prior to that he was in charge of engineering for a \$20 mil-

Harrison H. Roberts, manager of engineering and foreign operations for Intrusion-Prepakt, Inc.



lion irrigation and flood-control project in the Republic of Haiti for Brown & Root, Inc. Roberts has also served as chief engineer on such projects as the Bull Shoals Dam, Detroit Dam, Liberty Dam, and the U. S. Air Force base construction projects in France.

He is a member of the American Society of Civil Engineers, the Society of American Military Engineers, the

American Concrete Institute, and the American Naval Institute.

Gen. S. D. Sturgis (ret.) heads engineering board

Lt. Gen. S. D. Sturgis, Jr., former chief of the U. S. Army Corps of Engineers, has been appointed by the International Joint Commission as chairman of the U. S. Section of the International Passamaquoddy engineering board. Gen. Sturgis retired from the Army last September after 38 years of service in the Corps of Engineers.

The board which Sturgis will head will make all engineering investigations and studies on the proposed Passamaquoddy Tidal Power Project in the state of Maine and in New

Brunswick, Canada. At the same time, a section on field investigations and design studies has been established in the office of Brig. Gen. Robert J. Fleming, Jr., the New England division engineer of the Corps of Engineers.

The investigations and studies are expected to take three years to complete.

C. W. Enfield appointed solicitor of the BPR

Secretary of Commerce Sinclair Weeks has appointed Clifton W. Enfield solicitor of the U. S. Bureau of Public Roads. Mr. Enfield is now the assistant attorney general for the state of Oregon and is chief counsel for the Oregon State Highway Commission. In his new position, Mr. Enfield will serve with John A. Volpe, the pro tem Federal Highway Administrator.

Enfield is a member of the Highway Laws Committee of the Highway Research Board, the National Academy of Sciences, and is an advisor to the Characteristics of Legal Tools Subcommittee of the National Committee on Urban Transportation. He also holds membership in the Joint American Association of State Highway Officials, and the American Municipal Association Committee on Urban Highway Needs.

Announcement of additions to CIMA's official staff

The Construction Industry Manufacturers Association has announced the appointment of Robert P. McKenrick and Carl Allen to the organization's official staff. McKenrick, who will serve as CIMA's executive vice president, recently resigned as vice president in charge of sales for the construction machinery division of the Blaw-Knox Co., Pittsburgh, Pa. He had been with Blaw-Knox for over 28 years. Allen has, for many years, also been closely associated with the construction machinery industry. Both men will be located in CIMA's Chicago office. C. J. Haring held a temporary assignment with CIMA following the death of Harold Hess last August.

Bechtel vice president moves office to Texas

W. E. Arthur, vice president of Bechtel International Corp., has moved to the parent firm's new regional office in Houston, Texas. Bechtel International is a branch of the Bechtel Corp. of San Francisco, Calif.

From offices at the Texas National Bank Bldg., Arthur will be the Gulf Coast representative of the engineering and construction firm.

Corps of Engineers news

Col. Thomas D. Rogers has been named to succeed Col. John T. O'Neill as district engineer of New York, N. Y., for the U. S. Army Corps of Engineers. Col. Rogers, formerly the Savannah, Ga., district engineer, is succeeded in that post by Col. Robert C. Bahr.

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TO CUT
COMPACTION
COSTS —**

- ✓ Obtain specified density in only one or two coverages
- ✓ Compact deeper lifts (up to 36") in one pass

In the next ten years of accelerated highway construction, more dirt will be moved and compacted than ever before!

When your bid price includes specification compaction, will you use the old time-and-money-wasting method of rolling and re-rolling... OR WILL YOU CUT COMPACTION COSTS WITH A CEDARAPIDS VIBRATORY COMPACTOR?... the only pneumatic-tired compacting unit available that combines static weight with dynamic impact which imparts an additional 3% to 10% compaction over conventional static-weight rollers! Imagine a 60,000-lb. weight slammed against loose soil by a powerful vibratory thrust 600 to 1400 times a minute! It does more than just press the soil down... it actually rearranges soil particles to force out moisture and eliminate air voids. By changing the rate of vibration, decreasing or increasing the weight of the unit, and varying tire pressures from 50 to 100 lbs., the Compactor meets a wide variety of soil conditions.

Check the compaction job-report shown below... then ask your Cedarapids distributor for details about both 60,000-lb. and 25,000-lb. Vibratory Compactor models.



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with Cedarapids VIBRATORY COMPACTORS**

Typical Example of Reducing Compaction Costs

Before a Cedarapids Vibratory Compactor was used on a highway job which was almost entirely new-location construction, the contractor had to remove two fill areas and then replace them, as he was unable to get the required 90% of density with another type of roller. By using the Cedarapids Compactor in the new fills, he was able to reach 90% density in one to two coverages over 4" lifts. The only time the contractor had previously been able to reach this density was when more than 16 passes were made over each lift. As he was being paid only his bid price, and no premium for compaction, his savings with the Cedarapids Compactor were substantial.

TABULATION OF COMPACTION TESTS

Date	5-31-49	6-1-49	6-1-49
Hole No.	36	38	39
Hole Location	Sta. 693 + 12	Sta. 696 + 25	Sta. 694 + 0
Hole Depth	7"	7"	7"
Type of Soil	Decomp. Granite	Decomp. Granite	Decomp. Granite
Depth of Lift	4"	4"	4"
Tire Pressure	100 lbs.	100 lbs.	100 lbs.
No. of Coverages	1-2	1-2	1-2
Speed	2 1/2 MPH	2 1/2 MPH	2 1/2 MPH
Towing Unit	D-7	D-7	D-7
Percent Moisture	7.9%	6.4%	7.5%
% Compaction Std. AASHTO	90% Mod.	90% Mod.	90% Mod.
% Compaction Obtained	96.2%	93.3%	93.6%

IOWA MANUFACTURING COMPANY Cedar Rapids, Iowa

For more facts, use Reader-Reply Card opposite page 18 and circle No. 225

Harold L. Aitken, engineer in charge of the Washington, D. C., office of the Clarkson Engineering Co., Inc.



Clarkson Engineering appoints H. L. Aitken

Harold L. Aitken has been named engineer in charge of the Washington, D. C., office of the Clarkson Engineering Co., Inc., Boston, Mass. For 21 years Aitken was associated with the U. S. Bureau of Public Roads, resigning in 1951 to become state engineer of Nebraska.

In 1953 Aitken was appointed to serve under Val Peterson in the Federal Civil Defense Administration, administering and managing the activities of the agency.

Col. M. C. Prichard (ret.) returns to Oman Construction

The Oman Construction Co., engineering and construction firm of Nashville, Tenn., has announced the return of Col. Mason C. Prichard (U. S. Army ret.) to the post of vice president.

Col. Prichard, as a member of the U. S. Army Corps of Engineers, served as chief of investigation and construction of the Florida Ship Canal, was in charge of the flood control section of the Corps, and was chief of operations, Caribbean Division, on the construction of the U. S. Army air bases in British possessions in the Atlantic and the Caribbean.

He is a member of the Board of Direction of the American Society of Civil Engineers.

National Slag elects executive committee

At its 39th annual meeting in October in Washington, D. C., the National Slag Association elected A. W. Wood president for 1957. Wood is the general manager of the Cleveland Slag Division of the Standard Slag Co. and is also president of the Lorain Slag Co.

Other executive members elected for 1957 are C. W. Ireland, vice president; E. W. Bauman, managing director; and W. S. Shaw, treasurer. The new members at large of the executive committee are R. O. Dierker, Edward C. Levy, R. K. Plumb, and H. N. Snyder.

American Bridge Assn. elects vice president

D. Louis Tonti has been elected vice president of the American Bridge, Tunnel, and Turnpike Association. He was also re-elected to the association's board of directors for a three-year term.

Since the beginning of 1955, Tonti has been the executive director of the New Jersey Highway Authority, which operates the Garden State Parkway.

Raymond Concrete appoints new district manager

Raymond Concrete Pile Co., foundation and construction firm of New York, N. Y., has appointed William A. Cunningham its Philadelphia, Pa., district manager, with headquarters in the Liberty Trust Bldg., Broad and Arch Streets.

Cunningham, before joining Raymond Concrete, had been chief engineer on a Mississippi River lock-construction project, and prior to that had been a project engineer with the Turner Construction Co., New York.

N. Y. Mr. Cunningham succeeds William A. Back, now engineering consultant at Raymond's New York office.

Gordon W. Wagner joins Mid-Valley Constructors

Gordon W. Wagner has joined the Mid-Valley Utility Constructors, Inc., Houston, Texas, as the firm's construction manager for the continental United States. Prior to joining Mid-Valley, Wagner was 21 years with the H. K. Ferguson Co., Cleveland, Ohio.

Wagner worked on projects in the United States and Europe organizing

initial personnel and establishing procedures for Ferguson. He also managed the Cincinnati division of Ferguson, where he was in charge of en-

Gordon W. Wagner, construction manager for Mid-Valley Utility Constructors, Inc.



engineering and construction of processing plants.

How a Reputation Was Earned for Low Upkeep and Big Output



ONE reason why Bucyrus-Erie excavators are so popular is their reputation for low maintenance. It's a reputation that's been earned with advantages like these —

Bucyrus-Erie's Individual Design for each model in its line matches every component to rated capacity — machines are never stretched to create a new model. There are few wearing parts, dead-weight is reduced — you get maximum digging ability per pound of weight.

There's *quality-control* of every manufacturing detail. Each steel shipment undergoes mechanical, chemical, and metallurgical tests . . . is micro-

photographed for close analysis. With foundry facilities unsurpassed in the industry and an extensive, modern welding shop, Bucyrus-Erie pours its own castings and makes its own weldments. Thorough control is maintained over both manufacturing processes to insure the high quality that means top performance over years of profitable service.

These are some of the factors that contribute not only to minimum maintenance, but also to big output at low cost . . . and extra years of service. See your Bucyrus-Erie distributor soon for details on machines from $\frac{3}{8}$ - to 4-cu. yd.

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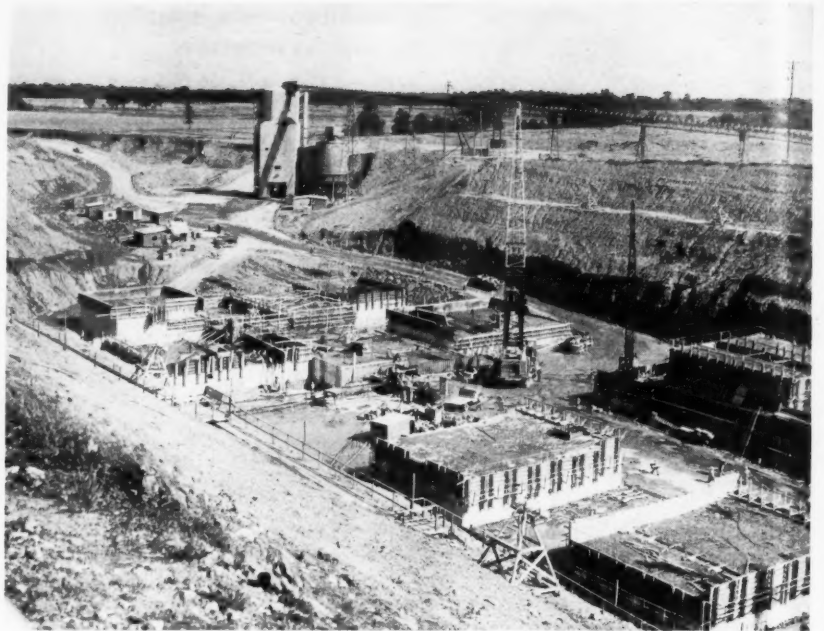
W I S C O N S I N

For more facts, use Reader-Reply Card opposite page 18 and circle No. 226



A Euclid tractor starts out from the Johnson plant with an Athey low-bed trailer carrying three Gar-Bro 4-yard buckets. A placing crane will swing an empty to the trailer before picking up a full bucket.

C&E Staff Photos



Not far from the Johnson batch plant a Manitowoc 4500 with 140-foot boom buckets concrete to pours at the downstream end of the lock. The batch plant turns out about 2,600 yards of concrete daily for the job.



As the Manitowoc 4500 crane picks up the third and last full bucket from the Athey low-bed trailer, the hauling rig gets ready to return to the batch plant with three empties.



Dwight D. Eisenhower Lock

Facility built with tunnel through vertical gate sill to Barnhart Island; network of mains, lines, risers, supply water and air for big operation

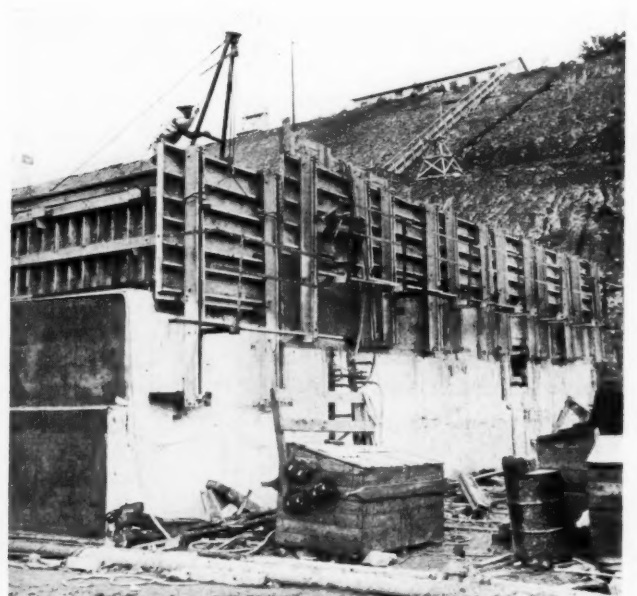
Cranes and buckets are being used to place concrete for the second navigation lock in the Long Sault Canal—the \$20,172,000 Dwight D. Eisenhower lock located in the middle of the 10-mile-long canal just south of Long Sault Dam. This lock—and the Grass River Lock that is being built with gantries downstream—will make it possible for shipping to bypass the dam. Vessels will be raised to pool elevation behind the dam when they

are moving upstream, and lowered to river level when moving downstream.

Formerly known as the Robinson Bay Lock, the structure is being built by a joint-venture combine, Robinson Bay Lock Constructors, made up of Morrison-Knudsen Co., Inc., Boise, Idaho, the sponsor; Walsh Construction Co., New York, N. Y.; and Perini-Quebec, Inc., Montreal, Canada. Like the Grass River Lock and the Long



Pours for the upstream miter gate sills, vertical lift-gate sill, and the roadway tunnel through the lock are handled by American stiffleg derricks powered by American hoists.



Anchored to the top of a lift, a contractor-built A-frame jacking device equipped with a chain hoist lifts the 5x10-foot Blaw-Knox steel form sections for the next pour.

Sault Canal, it is being built by the St. Lawrence Seaway Development Corp. and is scheduled for completion by December, 1957.

Forming

Blaw-Knox prefabricated steel form-panel sections are being used to form the various monoliths of the lock walls, which are about 1,100 feet long to provide enough length for the upstream and downstream sills and still leave an 800-foot-long lock chamber between them. These panels, used to form vertical faces, such as the inside faces of both walls, are 5 feet high and 10 feet long. Panels forming the battered outside surfaces of the walls are 6 feet high and 10 feet long. Pours for all monoliths are made in 5-foot lifts about 44 feet long.

Forms for emptying and filling culverts and their feeder culverts, and for the pool regulation culverts, are being fabricated on the job and will require about three million board feet of lumber. They consist of $\frac{1}{4}$ -inch plywood facing backed with $\frac{3}{4}$ -inch-thick 1x6-inch ship-lap sheeting. Studs are 2x6-inch stock, spaced on 12-inch centers, with 4x6-inch walers spaced about 30 inches apart. All are tied with Williams form hardware.

The forms being fabricated on the job are made in the carpenter shop, located in the contractor's yard, which is equipped with a Black & Decker bench drill stand, Crescent band saw, a new joiner, Walker-Turner table saw, a SkilSaw 14-inch-diameter bench saw, three portable SkilSaws, and many power hand tools.

Save time on concrete work

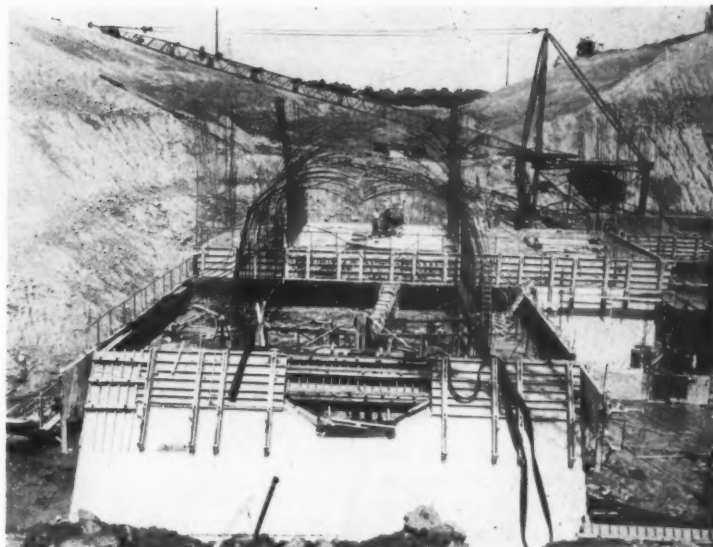
Five batch trucks—Euclid tractors pulling Athey low-bed trailers capable of supporting four Gar-Bro 4-yard buckets—bring concrete to the cranes handling the lifts. Each of the concrete hauling rigs carries four air-operated buckets to a crane, then returns to the batch plant with three buckets while the crane is handling the fourth. This saves only seconds, but on a project of this size, which calls for the placing of 513,000 cubic yards of concrete on a tight construction schedule, these seconds add up to a substantial saving in time and money for the contractor.

Two Manitowoc 4500 cranes with 140-foot booms, powered by Cummins diesels, are handling the pours for the north and south lock walls. Pours for the upstream miter gate sills, the vertical lift-gate sill, and the roadway tunnel through the lock, that will provide access to Barnhart Island, are being made at the upstream end of the walls by two American stiffleg derricks, powered by American hoists and equipped with 192-foot booms.

As concrete is placed, it is consolidated with Malan air-operated vibrators and cured for 36 hours before forms are stripped. Unexposed surfaces are cured with Hunt Clear Cure, which is placed after a pour is completed. All horizontal surfaces and exposed vertical surfaces are water-cured.

A contractor-built A-frame jacking
(Continued on next page)

Steel reinforcing gives shape to the Barnhart Island highway tunnel that will go through the lock walls and the vertical lift gate sill adjacent to the upstream miter gate sill. The American stiffleg derrick places concrete at the upper end of the lock.



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everywhere

the G-800 TRACDRILL

The self-propelled CP Tracdrill pivots . . . moves forward or backward and can turn in its own length! "Tracdrill" has a hydraulically actuated U-arm for fast drill carriage positioning. Can tow a 13,000 pound compressor up a 10% grade. Its "knee action" crawler tracks take rough terrain in stride. You save time moving from hole-to-hole, get more accurate spotting and gain productive drilling time.







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device, equipped with a chain hoist anchored to the lift just placed, is used, together with an Austin-Western crane, to raise forms from one lift to the next. Forms are held in position by temporary braces tied back to anchors embedded in the top of the previous lift and tie bolts anchored to the outside surfaces of the monoliths. Completed wall sections are about 60 feet wide at their bases, which rest on bedrock, and rise to heights of between 105 and 115 feet above rock. At the top, they are 16 feet wide.

Water and air

Water and air are supplied to the pours along the length of both lock walls by a network of main lines, branches, and risers. There are two 4-inch-diameter vertical lines, one for air and one for water, spaced at 88 feet along each wall and embedded in the concrete monoliths. The risers, raised in 10-foot lifts to keep them well ahead of the 5-foot pours, will rise to the complete height of the walls and, when the project is finished, the lines will be grouted and left in place. A total of seven 1-inch outlets and two 1½-inch outlets are on each of the risers to provide connections for the pneumatic and hydraulic lines. These risers are embedded in the monoliths to keep them from being frozen and damaged by the large amounts of construction equipment around the site, and to eliminate the need for lengthy rubber air lines that would constitute a safety hazard to the many men in and around the pour areas.

Water required in the construction of the lock is being pumped from the St. Lawrence to a 300,000-gallon storage tank at the site through a Naylor 12-inch Spiralweld pipeline. A Fairbanks-Morse centrifugal pump at the tank, acting as a booster, pumps water into the distribution network through a Naylor 8-inch line at 200 psi. This line leaves the tank and goes down the south side of the excavation, passes through the south wall monolith, and branches into the Naylor 6-inch-diameter lines running along the toe of each wall. Another 6-inch line, tapped off these main feeder lines, runs back up the excavation to the compressor house to provide water for cooling the compressors. All the 4-inch risers are tapped off the 6-inch lines carrying water to the concrete lifts.

Air requirements for the project are supplied by a compressor bank of four Ingersoll-Rand 1,000-cfm compressors driven by Electric Machinery synchronous motors. Air leaves the compressor house through a receiver tank in a Naylor 6-inch pipeline that runs down the south side of the lock excavation, through the south wall, and into 4 and 6-inch branches laid along the toes of both walls next to the water line. Before going into the excavation, this line runs past a bypass valve that hooks a Tannergas tank into the line. This tank holds a special liquid compound which is sucked into the line by, and mixed with, the air. This fluid removes the moisture in the flow, thereby keeping



get exclusive 4-machine utility...finger-tip easy. in all International Drott 4-in-1 Skid-Shovels!



You get famous Skid-Shovel triple-power And pry-over-shoe break-out action

...plus 42° ground-level bucket roll-back...simply by moving a lever with finger-tip ease...stopped or on the go. You can also use fast, depth-controlled Drott straight-forward bucket loading—and time-gaining, strain-saving skid-shoe load

transport! You get this concrete-shattering break-out power, this stepped-up excavating and material-handling capacity, *only in the 4 International Drott Four-In-One sizes!* It's the 3-yard TD Four-In-One, shown, breaking up concrete slabs.

Aggregates, not dumped directly into the hopper that feeds the big overhead stockpiling conveyor, are dumped to their proper place by an Omaha Standard 20-ton trailer pulled by an International truck.

C&E Staff Photos

the line from freezing during the winter months. Another Tanner tank is installed where the air line crosses to the north wall.

The great amount of water being used to cure and green-cut the concrete lifts is being removed from the lock excavation by dewatering pumps that discharge into a common sump hole about 12 feet deep and 20 feet in



Alongside the stockpile is the rail spur for cement delivery. Rail cars bottom-dump to a hopper, and cement goes through air-activated conveyor pipeline to storage bins.

diameter. This sump was blasted out of the bedrock at the downstream end of the lock excavation by dynamite and primer cord. All the dewatering pumps, scattered throughout the lock, discharge into the sump, which is equipped with a Johnston and two Deming pumps. The Johnston, with a 10-inch discharge line, is driven by a 150-hp electric motor; the Deming pumps, with 8-inch discharge lines, are driven by two U. S. Motors 100-hp motors. The pumps discharge into two lines—Naylor 8- and 10-inch Spiralweld lines—that run up the north side of the excavation. This lift of about 160 feet is handled easily by the pumps, permitting the discharge to run into a drainage ditch feeding into the St. Lawrence.

Highway tunnel

Unlike the Grass River Lock, the Eisenhower Lock will have a 24-foot roadway passing through the 80-foot-wide and 78-foot-long vertical gate sill, upstream and next to the miter gate sill, to provide access to what will become the St. Lawrence State Park on Barnhart Island. Two arch-shaped approach tunnels, 154 feet long, will lead from the open approach roadways to the tunnel, which passes through both walls and the sill. A 15-foot vertical clearance will be maintained between the roadway and the ceiling slabs in both the approaches and the sill.

These tunnels, with a 3-foot-thick reinforced concrete roof, are required on either side of the lock so that backfill material can be placed against the lock walls. Fill over the tunnels will average 45 feet in thickness and will slope from the top of the lock wall to the entrance of the approach tunnels. About 30 feet of water will be maintained above the sills to provide the 27-foot draft being carried through the project.

Handling aggregates

Concrete for this project is being produced by a well planned batching setup located near the site. Aggregate, supplied for both lock jobs from a Helena, N. Y., quarry, is delivered in Omaha Standard rear-dump and belly-dump trailers pulled by International trucks. Trailers dump into a hopper equipped with four Pioneer feeders that feed a Hewitt-Robins

For big bulldozing

capacity, just move the Four-In-One's machine-selector lever to open the clam hydraulically. Then you regulate dozing depth, easily and accurately, by hydraulic radius control of blade pitch (forward or backward)—to roll earth, to backfill, grade or spread with precision. Watch this TD-14 Four-In-One as a dozer—stripping hard-frozen top-soil, 8 inches deep—keeping construction rolling, even in cold weather. This responsive, large capacity bulldozing action, Drott-developed, is another Four-In-One exclusive!

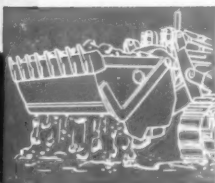


See how positive clam lip control enables the Four-In-One Bulldozer to heap-load itself, with fast, earth-boiling action. Then it's easy to dump the material all at once, or spread it evenly. Use the load-weighted bucket, and hydraulic down-pressure, too, for positive fill compaction. Here's the new bonus-powered TD-9 with 1½-yard Four-In-One working as a multiple-duty Bulldozer.

Nobody but International Drott gives you Four-In-One Bullclam

versatility, to strip, grade, spread, or compact with inch-close accuracy—to put regular "carry-type scraper" action at your finger-tip command!

See how positive clam lip control enables the Four-In-One Bulldozer to heap-load itself, with fast, earth-boiling action. Then it's easy to dump the material all at once, or spread it evenly. Use the load-weighted bucket, and hydraulic down-pressure, too, for positive fill compaction. Here's the new bonus-powered TD-9 with 1½-yard Four-In-One working as a multiple-duty Bulldozer.



See how you quickly switch to clamshell

action to "surround" loose material, get instant bucket-fill in one fast gulp, and save hand labor on clean-up work. You can also use the Four-In-One clamshell position for big-capacity stockpile material handling. And the

versatile Four-In-One clamshell, as a bottom-dumper, gives you a 2½-foot dumping height advantage over ordinary roll-forward buckets! Yes, and bottom dumping assures you positive bucket cleanout, even of sticky clay or gumbo! Only an International Drott Four-In-One gives you this built-in, job-getting clamshell action. Here's the 1-yard TD-6 Four-In-One "cleaning up" around a foundation.



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Drott Manufacturing Corp., Milwaukee 15, Wis.



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At the downstream end of the lock excavation, background, is the C. S. Johnson batch plant, fed with aggregates by conveyor belt and with cement by an enclosed bucket elevator more than 100 feet high.

(Continued from preceding page)

30-inch belt. This belt, in turn, feeds a 30-inch shuttle belt riding an overhead stockpiling conveyor. The shuttle belt moves back and forth on the conveyor so that aggregate can be end-dumped to one of the stockpiles of sand and $\frac{3}{4}$ -inch, $1\frac{1}{2}$ -inch, 3-inch, and 6-inch stone. This entire conveyor system, including the shuttle belt arrangement over the stockpiling conveyor, was designed, fabricated, and furnished by the Idaho Sprocket & Machine Works, Boise, Idaho. The entire system is equipped with Hewitt-Robins conveyor belts.

An 8-foot-diameter reclaiming tunnel, made of Republic sectional plate, houses a Hewitt-Robins 30-inch belt on an Idaho Sprocket conveyor under

the stockpiles. Under each size of stone and under the sand are a series of gates that drop aggregates to this belt, which travels at a rate of 351 feet per minute. There are two Pioneer feeders under the 6-inch pile, three Syntron feeders under the sand pile, and two Idaho Sprocket gates under each of the remaining piles for $\frac{3}{4}$ -inch, $1\frac{1}{2}$ -inch, and 3-inch stone. Gates are operated by the man operating the washer-shaker setup between the reclaiming tunnel and the batch plant.

Aggregates end-dump into the washer-shaker—a Symons 5x10 vibrating rod deck screen—while sand bypasses the setup through a flap gate and continues up another belt conveyor to the batch plant. Water for the washer-shaker is supplied from the 300,000-gallon storage tank that feeds water from the St. Lawrence to the entire project. Water is sprayed onto the aggregates passing over and through the screen by a series of nozzles located above the screen itself. Material passing through the screen is caught, together with the water, in a tub that feeds a discharge line emptying into a drainage ditch.

Aggregates leaving the Symons washer-shaker are picked up by another Hewitt-Robins belt that rides an Idaho Sprocket conveyor, about 900-feet long, to the rescreens on top of the batch plant's aggregate bin. Rescreens consist of two double-deck 5x14 Tel-smith Vibro-King screens, the top deck with $3\frac{1}{2}$ -inch-square openings, second deck with $1\frac{1}{8}$ -inch openings, and the third deck with $\frac{7}{8}$ -inch openings. The bottom deck is a No. 5 screen. Everything passing this screen is wasted in a pile adjacent to the plant. Material is removed from this pile by dump-trucks that are filled by a front-end loader.

Everything running off the top $3\frac{1}{2}$ -inch deck is classified 6-inch stone and goes through a separate chute into a compartment of the Johnson bin. Material off the second screen is classified 3-inch stone; material off the third screen, $1\frac{1}{2}$ -inch stone; and material off the bottom screen, $\frac{3}{4}$ -inch stone. Each size stone also goes through separate chutes into different bin compartments.

Cement handling

Cement is delivered by rail cars to a spur adjacent to the stockpiles and bottom-dumped into a hopper feeding a Robinson air-activated conveyor system. Cement is transferred about 1,100 feet from the hopper to the storage silos at the batch plant through a 4-inch-diameter line. The four silos at the plant, having a total storage capacity of 15,470 barrels, include a 7,200-barrel and a 4,800-barrel silo for portland cement storage, and a 2,600-barrel and an 870-barrel silo for natural cement storage. Besides the four silos, there is a 500-barrel portland cement silo in the center of the aggregate bin in the plant. All silos are Johnsons, as is the entire plant.

Natural and portland cement are

NEW 360 HALF-YARD HOPTO

DIGGER • SHOVEL • CRANE



Here's the completely hydraulic *mobile* shovel that equips you to do more jobs with lower equipment investment... at greater profit!

The 360 HOPTO swings three hundred and sixty degrees from its over-the-cab travel position. Operator's cab swings with unit for face-forward, *safe* operation. Feather-touch controls actuate every movement from positioning of outriggers to fast-cycling swing and 180° tilt of bucket! Heavy-duty hydraulic system with built-in relief valves gives an easily managed, oil-cushioned, 20 ton force to dipper stick!!!

Interchangeable backhoes and shovel buckets have H and L replaceable teeth and are available in three-eighths and one-half yard sizes. Check *NOW* on the many advantages of owning this work-hungry, mobile digger, shovel, crane!

Write today for complete information on the '360' or any one of six quarter-yard HOPTO Models!



BADGER MACHINE CO.
DEPT. E • WINONA, MINNESOTA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 229

transferred from the storage silos to the bin compartment and 500-barrel silo, respectively, by an enclosed bucket elevator that is over 100 feet high. Portland cement, furnished from many sources, includes that made by Lehigh, Alpha, Universal, North American, and Dragon. Century and Louisville natural cements are being used.

By pressing a single button on the control panel in the plant, the operator opens the compartment gates so that portland and natural cement, and aggregates, sand, and water are dumped into separate batchers. This loading is stopped automatically as soon as the proper weight of each material has been deposited.

The weight of each ingredient going into the batcher is controlled through a system of pull wires connecting the batchers and the separate Johnson scales in the control room. A selector knob at the upper right-hand corner of the control panel is used to set all the scales simultaneously for the different weights of each ingredient required by the various mixes being used. This eliminates the time-consuming job of manually resetting each batcher scale every time a different mix is needed.

After the batchers have been loaded, the operator presses another button to open the batcher gates so that the ingredients can fall through a swivel chute to any one of the three Koehring 4-yard tilting-type mixers. A Johnson strip recorder in the control room records the time of release, the type of mix, and the weight of each ingredient dumped to a mixer. After the 2½-minute mixing cycle, the Koehring mixer tilts automatically to dump the 4-yard batch to a wet batch hopper. A dispatcher opens this hopper by means of an air-operated release to fill the waiting concrete buckets.

A weight breakdown of the ingredients making up a 4-yard batch of 6-inch interior concrete shows the following amounts of material:

Portland cement	846 pounds
Natural cement	282 pounds
Sand	3,649 pounds
¾-inch stone	2,576 pounds
1½-inch stone	2,221 pounds
3-inch stone	2,699 pounds
6-inch stone	4,228 pounds
Water	701 pounds
Admix (Airin)	800 grams

Excavation for basins

The 2,575,000 cubic yards of earth excavation for the lock was done under a separate contract, but an even greater amount of earth—3,486,000 cubic yards—is being excavated by the Robinson Bay Lock Constructors for the waiting basins of the lock, the guide and guard walls, and the channels upstream and downstream from the lock. Most of this material is being stockpiled. About 1,400,000 yards of it will be used as backfill for the lock, while 640,000 cubic yards will go into dikes on the upstream edges of the proposed channel.

Basin excavation is being done by a Bucyrus-Erie 150-B electric shovel with a 6-yard bucket, which loads a

fleet of twenty-four Euclid 18-yard rear-dumps. The material is hauled away to a nearby storage area for later use as lock backfill and dike embankment. A second Bucyrus-Erie shovel, a 54-B with an Esco 2½-yard bucket, is also used to keep the hauling fleet moving with full loads.

Caterpillar D8 tractors with dozers assist the shovels, and Caterpillar No. 12 motor graders are spotted to maintain the haul roads throughout the project site. There is a total of eleven Caterpillar D8's on the job. A Bucyrus-Erie with a 2½-yard dragline

bucket is used for digging in virtually inaccessible areas of the excavation.

One of the Manitowoc 4500 cranes was used as a dragline when channel excavation started, loading the twenty-four Euclids with its 6-yard dragline bucket. This phase of the work is essentially completed.

Excavated material being used as backfill for the lock is spread by Cat D8 tractors in layers about 8 inches thick and compacted with sheepfoot rollers and a Buffalo-Springfield Kompactor powered by a Cummins

diesel. A select backfill material, to be used in and around the ends of the lock, will be placed in almost the same manner. Compaction of these 8-inch lifts will be handled by a Ferguson 200-ton pneumatic roller, loaded only to 100-tons and pulled by two Caterpillar D8 tractors.

In placing fill material for the dikes, the Caterpillar D8 tractors first spread the material in an 8-inch lift. A Buffalo-Springfield Kompactor then makes a few passes over the new fill. This is followed by a pass made by a sheepfoot roller, pulled by a Cat D8,

The CLEVELAND 80W

- a SIDECRANE



- Lays pipe • 30,000 Ft. Lb. Capacity
- Power Boom... Up and Down • 4 Line Speeds
- Long Reach... 21 Feet • Sets Bends, Valves
- Unloads... Strings • Pulls Sheathing, Etc.

- a BACKFILLER



- Backfills Fast... 20 Passes Per Minute
- 4½ Ft. Scraper Board • Backfills Clean
- Stays off Completed Work • Backfills from Either Side of Trench • Works Safer... Parallels Work • Fits All Job Conditions

- a TAMPER



- Fills and Tamps Simultaneously
- One Machine... One Operator Does it All
- Meets Density Specifications • Tamps from the Bottom Up • Parallels Work... No Straddling • Tamps Wider... Tamps Safer

- Does ALL 3 Related Jobs - Better!

In 1957 USE THE 80W AND SAVE... ON MONEY, MEN AND MACHINES

See It at the Road Show, Jan. 28-Feb. 2, North Hall, First Floor, Location B.

GET THIS 12-PAGE BULLETIN NOW!

- Complete Specifications
- Detailed Description of All Features
- Dozens of On-the-Job Action Photographs of Numerous Applications



Everywhere

THE CLEVELAND TRENCHER COMPANY

20100 St. Clair Avenue

Cleveland 17, Ohio

For more facts, use Reader-Reply Card opposite page 18 and circle No. 230



A Bucyrus-Erie 150-B electric shovel uses a 6-yard bucket to load a Euclid 18-yard rear-dump during excavation for the waiting basin. Excavation here totals 3,486,000 yards. C&E Staff Photo

(Continued from preceding page)

which loosens up the fill so that a good bond is obtained between lifts.

Safety procedures

All the activities at the lock are constantly under surveillance by the contractor's safety engineer, whose job it is to detect any safety violations. One of his responsibilities is to instruct local labor on such safety procedures as keeping an experienced driver with a new man for about two 8-hour shifts. Drivers are also in-

structed—and reminded constantly—to give three blasts on the horn before backing up and two blasts before starting forward.

Weekly safety meetings—for the project manager down to each workman—are also held. The safety engineers usually sit in on the meetings of the project manager and his superintendents, pointing out any violation of safety procedures noticed during his inspection tours. Superintendents, in turn, relay this information to their foremen at subsequent meetings. The contractor's safety procedures generally exceed those set up by the Corps of Engineers.

Personnel

The work on the Dwight D. Eisenhower Lock is under the direction of A. H. Johnson of the Morrison-Knudsen Eastern District office in New York, N. Y. John Armitage is the project manager, for the Robinson Bay Lock Constructors, which has about 1,000 men on a 24-hour payroll. Edward Eaton is the general superintendent; George Keys, the grading superintendent; Dee Henderson, plant superintendent; and Richard Daley, safety engineer.

Wayne Wolfe is the resident engineer and Roy Klingebell, assistant resident engineer on the job for the Buffalo District, U. S. Army Corps of Engineers, the contracting and design agency for the St. Lawrence Seaway Development Corp. T. F. Airis is the area engineer, and R. H. Brown, assistant area engineer for the Corps on all Seaway work in the area.

THE END

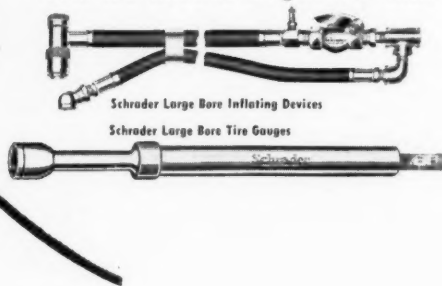
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Here's why: Schrader knows the way to make your tire maintenance easy, economical. Schrader provides Large Bore Valves, built with the same experience and quality that has meant top service for all tire gauges, valves, and tools for so many years all over the world. And Schrader provides the tools to service your tires.

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FOR ORIGINAL EQUIPMENT AND REPLACEMENT

For more facts, use Reader-Reply Card opposite page 18 and circle No. 231

Flexible chain couplings

A completely revised edition of its 16-page catalog on flexible chain couplings is available from the Morse Chain Co. Specifications, dimensions, ratings, and applications are given on Series DSC, Series SA silent chain couplings, and Series DRC roller chain couplings. Pertinent information is also tabulated on stamped steel covers, plastic covers, and split aluminum covers.

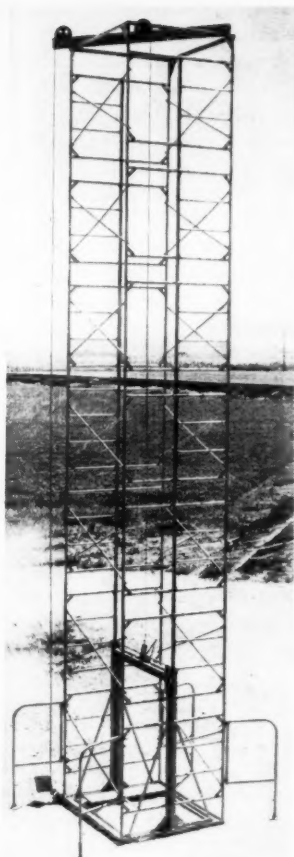
To obtain this catalog write to the Morse Chain Co., Industrial Sales Division, Ithaca, N. Y., or use the Request Card at page 18. Circle No. 85.

Chrysler promotes two

The Chrysler Marine and Industrial Engine Division of the Chrysler Corp., Detroit, Mich., has promoted M. J. Yost regional manager and J. J. Lapp representative of the Los Angeles, Calif., office.

Yost, a 29-year veteran with Chrysler, was formerly sales representative of the Seattle, Wash., office. Lapp previously served as engineer and field service representative for Federal Motor Trucks.

CONTRACTORS AND ENGINEERS



The new Bil-Jax light duty material-hoisting tower.

Light-duty hoisting tower can be raised to 50 feet

■ A light-duty material-hoisting tower designed to operate under loads of up to 2,000 pounds is announced by Bil-Jax, Inc. The tower can be erected to any height up to the maximum of 50 feet.

The portable tower is available with frames and braces in a variety of sizes to match whatever scaffold and frames the contractor may already own. Frame sizes offered include 4x4, 5x4, 5x4½, 5x5, and 5x6½ feet. Component parts include the cathead, the top frame section, the platform assembly, the tower frames, and braces.

Optional equipment includes such items as power units, steel cables, cable guides, and outrigger frames. A feature of the tower is an automatic safety stop that prevents the free falling of the platform.

For further information write to Bil-Jax, Inc., Archbold, Ohio, or use the Request Card at page 18. Circle No. 125.

Pipe installation

■ An installation guide for Transite and Ring-Tite pressure pipe is available from the Johns-Manville Corp. Topics in the pocket manual include handling and receiving the pipe, excavating the trench, assembling the pipe and coupling, cutting and machining the pipe, and pulling the pipe through casings. Data is also given on service connections, backfilling and tamping, and pressure and leakage tests. Diagrams, charts, and job photos supplement the text.

To obtain the guide write to the Johns-Manville Corp., 22 E. 40th St., New York 16, N. Y., or use the Request Card at page 18. Circle No. 14.

Pocket tool applies fasteners to V-belts

■ A tool for applying Alligator V-belt fasteners to open-end V-belt is available from the Flexible Steel Lacing Co. The tool is small enough to fit in a person's pocket.

The Alligator V-belt holder is made for B and C-section V-belts. It enables the user to make up V-belts of any length much quicker than was possible before, the manufacturer states. With a few feet of open V-belt and



the tool, it is claimed that a contractor can make emergency replacements with a minimum of down time.

For further information write to the Flexible Steel Lacing Co., 4607-31 Lexington St., Chicago 44, Ill., or use the card at page 18. Circle No. 117.

General Tire announces division building program

The General Tire & Rubber Co. of Akron, Ohio, has announced a two-year, \$3¼ million building program for six of its divisions, in addition to a \$500,000 addition to its Brittain, Ohio, warehouse. The divisions affected by this program are in Detroit, Mich.; Boston, Mass.; Denver, Colo.; Portland, Oreg.; and Charlotte, N. C. The newly completed Philadelphia, Pa. office is the first to be built.

Convert gravel pit to Drive-In theater site

Dallas movie-goers now watch current films at a new drive-in theater which was, until recently, a worked-out and abandoned gravel pit. Theater programs could read: "Earthmoving by George O. Walker Construction Co., Dallas, Texas".

Filling and leveling a gravel pit is a unique way to build a theater—but Texans like to do the unusual. So Walker moved in...loaded, hauled, and spread 120,000 yds. of sand and caliche to turn the irregular hole-in-the-ground into an attractive theater setting.

To move this yardage, Walker used a LeTourneau-Westinghouse team of 5 D Tournapulls and 1 208 hp rubber-tired C Tournatractor.

Filled from old spoil banks

Fill for the pit was obtained by cutting down most of the banks, together with old spoil piles on the property, to form a symmetrical amphitheater. First a dozer leveled off the steepest spoil ridges on the borrow section...then Tournapulls moved in for the king-size dirt-moving task.

Averaging 5-yd. loads per trip, the "D's" loaded on banks...hauled down into pit for spread. Returning, Tournapull operators handled their own haul-road maintenance, by dropping scraper's blade to smooth out haul route.

2,400-ft. cycle in 3 min. 22 sec.

On a cycle distance of 2400', "D's" averaged 3 min. 22 sec. Rigs loaded in 20 sec., over a 60' distance. Loaded Tournapulls completed 1120' haul in 1 min. 36 sec., returned in 1 min. 16 sec. Spreads over a 100' distance, took 10 sec.

Dirtmoving was done during the winter months, when rains and cold weather made work difficult. Yet Tournapull production remained steady under all weather conditions. When an unusual 4" snowfall hit Dallas, for example, it interrupted work for only half a day. When the storm was over, rigs had no trouble operating in snow.

Out-perform comparable scrapers

Superintendent J. K. Mason had this to say about his D Tournapulls: "In my opinion, Tournapulls



Matched speed and traction of big rubber tires on pusher and scraper unit speeded up cycles. Single Tournatractor replaced 2 crawlers on this push-work.

will outperform any similar equipment on the market today. They will out-turn them, out-run them, and load faster! Anything you can get into a 'D' you can get out fast—and that's more than you can say for many other scrapers."

Owner George Walker found that his one Tournatractor handles the pushing job which formerly required 2 crawler-pushers. "This rubber-tired tractor is much less expensive to operate than crawlers," he stated. "Maintenance and upkeep costs, both for D Tournapulls and Tournatractor, are low."

Now 9 yards heaped

The improved D 'Pull, now available, has 7.3 cu. yds. struck capacity and 9 cu. yds. heaped. With its narrow 8' width, and axle-loads within allowable weight limits, rig is roadable without special permit. Write for details. Find out how this machine can make profits for you.

Tournapull, Tournatractor—Trademark Reg. U.S. Pat. Off. DP-1038-B-b



120,000 yds. of sand and caliche were moved in 60 days to transform gravel pit into amphitheater for a drive-in theater at Dallas, Texas. Work-team included 5 Tournapulls, 1 Tournatractor, and 3 crawlers.



LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS
A Subsidiary of Westinghouse Air Brake Company

ARBA



See you at the ROAD SHOW • Chicago • January 28-February 2, 1957

For more facts, use Reader-Reply Card opposite page 18 and circle No. 232

Three new V-8 engines available on truck line

■ Three new V-8 engines are available for the 1957 line of Chevrolet trucks, the company reports. The new line features 88 models on 22 different wheelbases. In all, combinations of eight engines and eight transmissions are available on the 1957 line.

The new Taskmaster V-8, which packs 160 horsepower, is standard on several of the models, as is the Super Taskmaster V-8, a 283-cubic-inch engine with 175 horsepower. The third new power plant, a high-torque 322-cubic-inch V8 called the Super Loadmaster, delivers 210 horsepower, more than any other Chevrolet engine.

Offered as standard equipment on the larger heavy-duty models is the



The Series 6400 Chevrolet truck with a conventional chassis and dump body, one of the 88 models on 22 different wheelbases in the 1957 line. This rig has a 156-inch wheelbase.



Three of 69 standard model 25-ton Dart Trucks—all equipped with Fuller 4-MS-1440, 4-speed Transmissions—owned by Southern Peru Copper Corporation. This is part of a \$2½-million order for 90 units, one of the largest of its kind ever placed.

FULLER Transmissions specified on \$2½ MILLION TRUCK ORDER!

The Southern Peru Copper Corporation has ordered a fleet of 69 standard model 25-ton Dart Trucks, all equipped with Fuller 4-MS-1440, 4-speed Transmissions. This is part of a \$2½-million order for 90 units, one of the largest of its kind ever placed.

These trucks will be used for a dual purpose in the development of the huge Toquepala and Quellaveco cop-

per deposits in southern Peru. First, they will help to remove the initial overburden, and later will haul copper ore from the open pits to the mine's concentrator.

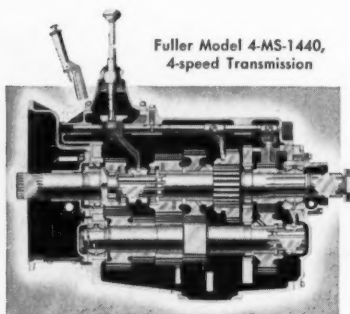
The big, rugged, heavy-duty, off-highway Dart trucks—specifically developed for mining operations such as this—are designed and built to haul top payloads profitably, over the roughest terrain.

It is only natural then, that a dependable, durable, transmission was carefully selected to efficiently and effectively deliver power from the 335

hp Cummins N.R.T. Turbocharged diesel engine, through a Twin Disc Model CO Torque Converter. *That's why Fuller was specified!*

On job after job, where loads are the biggest and going is the toughest, you find Fuller Transmissions *putting horsepower to work efficiently and economically.*

Next time you order heavy-duty construction equipment, *specify* Fuller Transmissions. From over 110 models available for rubber-tired equipment, there's a Fuller Transmission designed to do *your* job.



Fuller Model 4-MS-1440, 4-speed Transmission



FULLER MANUFACTURING COMPANY
Transmission Division, Kalamazoo, Michigan

Unit Drop Forge Division, Milwaukee 1, Wisconsin • Shuler Axle Company, Louisville, Kentucky (Subsidiary) • Sales & Service, All Products, Western District Branch, Oakland 6, California and Southwest District Office, Tulsa 3, Oklahoma.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 233

Loadmaster V-8 introduced last year. It is rated at 195 horsepower.

The eight transmissions include an automatic drive—either six-speed Powermatic or HydraMatic in two sets of gear ratios—for virtually every model. The Powermatic, optional on the bigger rigs, has a built-in retarding device that gives downhill speed control without the use of brakes.

Safety features applied throughout the line include interlocking latches on all side doors and steering wheels with the hubs recessed 3 inches below the rims. For easier access to low-cab-forward models, the bottom step has been dropped 4 inches and an assist handle has been installed behind the door.

Full air brakes are offered on many models. The air brakes, optional, are offered in conjunction with new extra-sturdy cast-spoke truck wheels.

For further information write to the Chevrolet Motor Division, General Motors Corp., General Motors Bldg., Detroit 2, Mich., or use the Request Card at page 18. Circle No. 73.

New sheave allows fast adjustment of V-belts

■ Introduction of new one and two-groove Magi-Key sheaves for adjustment of Texrope V-belt drives in A and B sections is announced by the Allis-Chalmers Mfg. Co. The new sheaves are reported to make adjustments quickly and easily.

Designed for low-horsepower applications, the Magi-Key sheave provides for increased maximum design horsepower, the company reports. A Magi-Key sheave the same size as a two-groove B-section cast-iron adjustable sheave will handle approximately three times more horsepower, according to the manufacturer.

In the Magi-Key sheave, keys transmit all rotational torque—from shaft to hub and from hub to discs. Set screws do not bite into the threads. The flexibly-joined set screw and key give a positive lock between the movable discs and the stationary hub. Because the key and set screw always remain joined and in place, they cannot drop out during adjustment nor can they become misaligned.

For further information write to the Allis-Chalmers Mfg. Co., 951 S. 70th St., Milwaukee, Wis., or use the Request Card at page 18. Circle No. 86.

Concrete batching bins

■ A revised general catalog of equipment for the concrete industry manufactured by the Lippert Bin Co. is available from the company. The firm offers a complete line of circular bulk cement batching bins in addition to its line of rectangular units. Also included in the catalog is information on Lippert's new line of automatic weighbatchers. Equipment for the ready-mix operator, the concrete products manufacturer, and the construction contractor is fully described.

To obtain this catalog write to the Lippert Bin Co., 2983 Beulah Road, Columbus 11, Ohio, or use the Request Card at page 18. Circle No. 93.

CONTRACTORS AND ENGINEERS

Two-way mobile radio offers 60 to 75 watts

■ The newest in DuMont's line of two-way mobile radio systems is the MCA-110-B, a rear-mounted vibrator-powered unit which offers from 60 to 75 watts across its entire frequency band—25 to 54 megacycles—according to the company. It is designed for use with either 6 or 12-volt electrical systems.

The MCA-110-B is constructed so that all tuning adjustments can be made from the top of the dash-



DuMont's MCA-110-B vibrator-powered two-way mobile radio offers from 60 to 75 watts over its entire frequency band—25 to 54 megacycles.

mounted control head. The transmitter, receiver, power supply, and all relays are incorporated into a casing that mounts in a passenger automobile trunk or in the corner of a truck body. According to the manufacturer, the unit is constructed to exceed RETMA humidity and vibration specifications.

The transmitter-receiver-power supply casing measures $6 \times 15\frac{1}{2} \times 19\frac{1}{2}$ inches and weighs 55 pounds. The control head is $2\frac{1}{2} \times 6\frac{1}{2} \times 3\frac{1}{2}$ inches. The speaker is 3 inches deep and has a diameter of $5\frac{1}{2}$ inches ($6\frac{1}{2}$ inches across the mounting). A front-mounted version, with the speaker and control head built into the communications casing, is also available. It is designated as the MCA-120-B.

For further information write to the Mobile Communications Dept., Allen B. DuMont Laboratories, Inc., 760 Bloomfield Ave., Clifton, N. J., or use the Request Card at page 18. Circle No. 58.

Welding electrodes

■ A new 28-page catalog covering 44 types of electrodes manufactured by the Hobart Bros. Co. is available from the firm. The catalog gives applications, procedures, recommended currents, physical properties, and available sizes. The 44 electrodes include mild steel, iron powder, low hydrogen, special alloys, hardsurfacing, aluminum, and bronze.

To obtain Catalog EW-195 write to the Hobart Bros. Co., Hobart Square, Troy, Ohio, or use the Request Card at page 18. Circle No. 94.

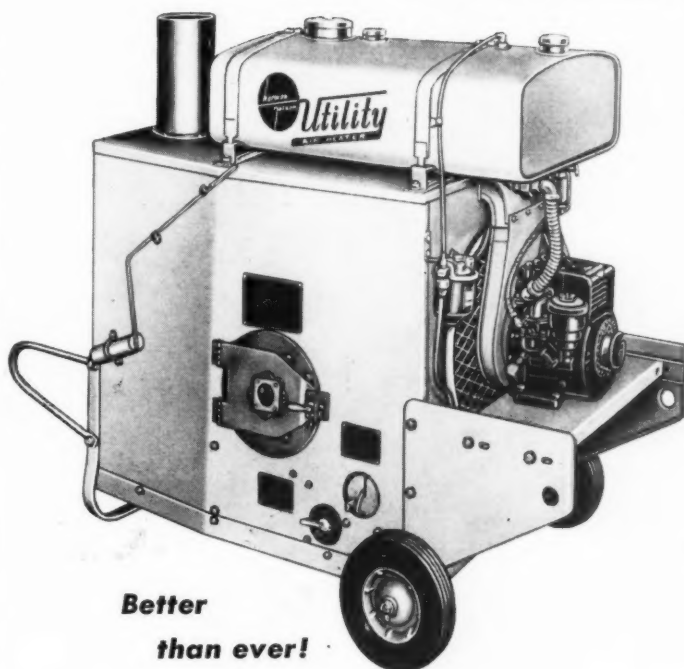
Colorado re-elects four

Stockholders of the Colorado Fuel & Iron Corp., New York, N. Y., have re-elected Charles Allen, Jr., Franklin Berwin, J. L. Holtzmann, and Charles G. Terry as directors of the company. All four men will serve for three years.

THE JIM DANDY PORTABLE SCAFFOLD can elevate 2,500 pounds to a height of 16 feet and has ample platform space for several men, according to the manufacturer, the Adam Co. The hydraulic, self-contained scaffold is recommended for both the large and the small contractor. It has been designed to eliminate wasted set-up and knock-down time. For more information write to the Adam Co., P. O. Box 628, Perry, Okla., or use the Request Card at page 18. Circle No. 84.



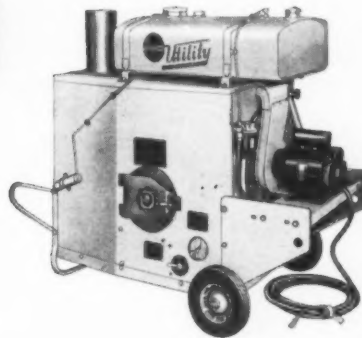
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Converts from
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engine

to
electric motor
in 20 minutes!



Herman Nelson "UTILITY" Portable Air Heater

Already tops in versatility and value, the "Utility" now offers you new, improved features! "Balanced air" combustion eliminates all smoke and soot. One-piece, 2-compartment fuel tank provides safe, easy filling. The "Utility" offers you more because you can interchange the power plants to suit your job... motor drive where you have electric current, or gasoline engine for remote job sites. The "Utility" gives the most heat for the least fuel of

any heater. It operates overnight without re-fueling. Also operates with either gasoline or fuel oils, without need of adjustments. May be used with or without ducts, and with or without venting, depending on job or location. Engineered for utmost safety, with automatic overheat cut-off, and safety trip valve that shuts fuel off when the prime mover stops. Manual heat control, self-cleaning burner. 75,000 to 425,000 BTU capacity.

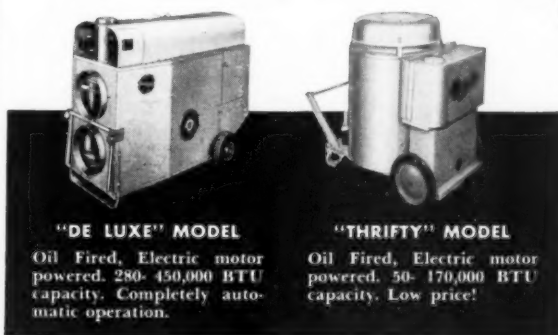
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Get FREE Weather Forecast Service, MAIL COUPON NOW!



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Oil Fired, Electric motor
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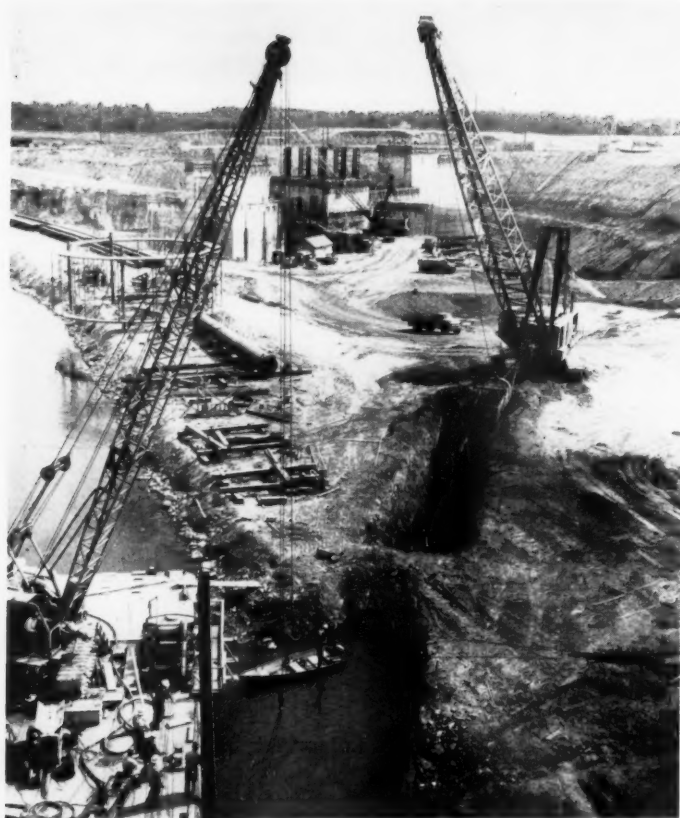
"THRIFTY" MODEL
Oil Fired, Electric motor
powered. 50-170,000 BTU
capacity. Low price!

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Rush me complete literature on portable heaters. Also send me your monthly Weather Forecast Chart, at no cost or obligation to me.

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COMPANY _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 234



Before the cofferdam is built, a Manitowoc with Page 6-yard drag-line excavates for the 61-inch pipeline that will feed water temporarily to the pumphouse while the intake is being built across the power canal, left.



Massena Intake

**Structure to regulate industrial, domestic water
in existing canal; total of 180,000 yards of
concrete required in ten types of mixes**

Since the water elevation above Long Sault Dam will rise from an existing 182.0 to a normal pool elevation of 238.0 to 242.0 when the St. Lawrence power projects are completed, the Massena Intake is being built to regulate the flow of water going from the reservoir to the Massena Power Canal. This canal links the south channel of the St. Lawrence River and Grass River; the \$7,800,000 gravity-type intake structure is being built just south of the south channel of the St. Lawrence.

The intake control section, being built by Morrison-Knudsen, Perini, Walsh, and Utah companies, consists of four fixed roller vertical gates operated by individual electric motor-driven hoists. It will permit the existing low-head hydro-power plant of the Aluminum Company of America in Massena to operate until power is available from the Barnhart Island Powerhouse in September, 1958. A few generating units are expected to be in operation in July, 1958, and the entire power project is to be com-

Tapered Roller Bearings
Support **BOTH ENDS** of EVERY
WISCONSIN ENGINE
CRANKSHAFT

Main bearing failure is unheard of in Wisconsin Heavy-Duty Air-Cooled Engines even when operating under heaviest loads on continuous duty. The tapered roller bearings take end thrust and side-pull, and mount on a crankshaft that is drop forged for maximum strength and load carrying capacity. Also, the bearings are self-cleaning, reducing engine maintenance and servicing.

The strength of tapered roller bearings and the drop-forged crankshaft contribute greatly to the rugged, long-term, trouble-free performance your Wisconsin Engine delivers. Write for handy service map S198 and list of distributors and service stations throughout the world.

WISCONSIN MOTOR CORPORATION
MILWAUKEE 40, WISCONSIN, U. S. A.
World's Largest Builders of Heavy-Duty Air-Cooled Engines



Better Performance Depends on Better Features....

For more facts, use Reader-Reply Card opposite page 18 and circle No. 235



NEW SINGLE SPEED... ALUMINUM HOUSING... POWER TAKE-OFF

IT'S A TULSA®... ALWAYS BEST!

Important features that make this new TULSA power take-off outstanding:

- Die-cast aluminum housing... extremely lightweight
- Output shaft rotates on two needle bearings
- Three output shaft sizes
- Cable or lever control
- Low priced

This new power take-off for all medium duty work offers all the advantages of the complete TULSA line—highest quality, nationwide distribution and service.



For more facts, use Reader-Reply Card opposite page 18 and circle No. 236

CONTRACTORS AND ENGINEERS



pleted by January, 1960.

The new structure, scheduled for completion in October, 1957, will also have a pumping plant with four 10,000-gpm pumps that will supply water for domestic and industrial use to Massena and the Alcoa plants. A system of pipelines will bring water to elevated tanks on the Alcoa plant property and to existing water mains that feed the village of Massena.

Excavation prepares way

Completion of the foundation ex-

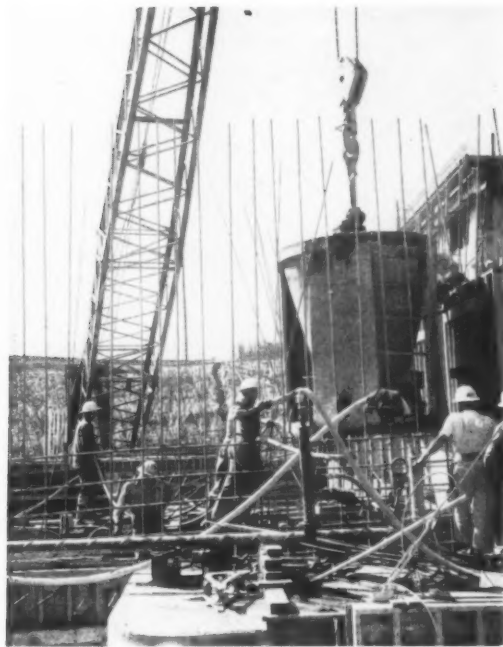
cavation for the first stage construction made it possible for the contractor to push ahead on concrete operations this season in an attempt to complete the first of two stages of construction.

Excavation, consisting of more than 3,200,000 cubic yards of earth, was started in August, 1955, by a 2½-yard shovel and two Manitowoc 4500 cranes that had been converted to shovels and equipped with Escro 5-yard buckets. An earth plug at the power canal

(Continued on next page)

◀ A Manitowoc 4500 crane with 140-foot boom picks up forming for the waterway section on the upstream side of the intake. The crane works from an unexcavated section which is shored by timber cribbing.

C&E Staff Photos

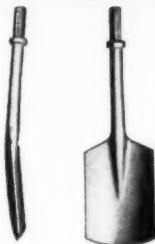


Workmen prepare to dump concrete into one of the waterway pier forms on the downstream face of the structure. Air for the air-operated Gar-Bro bucket is supplied through the Naylor 4-inch Spiral-weld pipeline, foreground.



DIGGERS SET

**DAILY
20' PACE**



Shank Sizes: ¾" sq x 2¼";
⅝" Hex. x 2¼"; ¾" Hex.
Rd x 2¼"; ⅝" Hex Rd x
¾"; 1" Hex x 4½". Blade
length: 16". Blade size:
4½"; 5½" and 8" width.

...with Brunner & Lay Clay Spades

There's good reason for this extra performance. These remarkably lightweight, well balanced Brunner & Lay Clay Spades for clay diggers help to reduce operator fatigue and increase the cubic yards of clay, earth or similar materials removed per day. These advantages plus durability have placed Brunner & Lay Clay Spades at the top of the wanted list by management and operators.

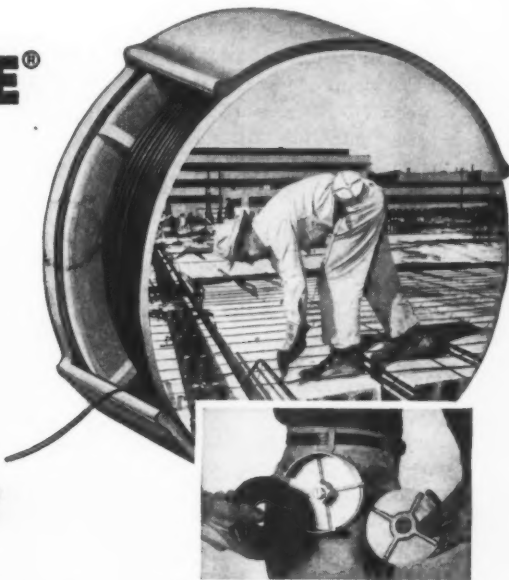
In the complete Brunner & Lay line there are tools for every clay digging, asphalt cutting, paving or rock breaking job—tools designed and fabricated to help cut your replacement costs. Distributed thru plants, warehouses and leading equipment distributors nationwide. Write for new catalog, just off press.

Brunner & Lay Products

Brunner & Lay, Inc. 9300 King St. Franklin Park, Ill.	Brunner & Lay Rock Bit of Philadelphia, Inc. 2514 East Cumberland St. Philadelphia 25, Pa.	Brunner & Lay of Los Angeles, Inc. 2425 East 37th St. Los Angeles 58, Calif.
Brunner & Lay, Inc. 150 Leslie St., Dallas, Texas	Brunner & Lay Rock Bit of Asheville, Inc. Sweeten Creek Rd., Asheville, N. C.	Brunner & Lay of Portland, Inc. 660 N. Tillamook St., Portland 12, Ore.
Birmingham Rock Bit Co., Inc., 5-18th St., S.W., Birmingham, Ala.		

For more facts, use Reader-Reply Card opposite page 18 and circle No. 237

CAL-TIE® WIRE in the handy reel dispenser



safe to use...

Cal-Tie Wire in the handy reel dispenser makes concrete reinforcement tying jobs safer because there's no old-fashioned shoulder coil to throw workers off balance... no awkward coil to catch on protruding objects... no danger of eye injuries... no scratches on neck or ears to become infected... and Cal-Tie Wire has a smooth, even surface.

easy to use...

Workers prefer to work with Cal-Tie Wire in the handy reel dispenser. They like the safety... its compactness and lightness... the way it doesn't cramp them when they're working in tight places... the way it eliminates tiresome treks to get a new coil to replace the partially-used one they had to abandon to do other work.

Contact your nearby CF&I representative today for the complete story on this safe, easy and modern way of tying concrete reinforcement bars.



CAL-TIE WIRE

THE COLORADO FUEL AND IRON CORPORATION

4245

THE COLORADO FUEL AND IRON CORPORATION—Albuquerque • Amarillo • Billings • Boise • Butte • Casper • Denver • El Paso
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For more facts, use Reader-Reply Card opposite page 18 and circle No. 238



Stone aggregate leaving the vibrating screen and riser are picked up by a U. S. Rubber 30-inch conveyor and brought to the vibrating rescreens of the C. S. Johnson automatic batch plant.

C&E Staff Photos

(Continued from preceding page)

kept the excavation area on the western edge of the canal dry so that earthwork could be carried forward.

The top 18 feet of material consisted of topsoil and was easily loaded to a fleet of fourteen Euclid 14-yard rear-dumps. But below this stratum, the contractor hit the glacial till that has been the nemesis of all the contractors working on the seaway and power projects. A mixture of clay, sand, gravel, and boulders, its density is almost equal to that of concrete and it had to be drilled and blasted. A Joy drill, front-mounted on a Caterpillar D6 tractor, used a 3-inch bit to sink holes 25 feet into the material. Air was supplied by an Ingersoll-Rand 600-cfm air compressor. These were loaded lightly with Atlas low-grade powder at a rate of 0.4 pounds per cubic yard of glacial till. As material was loaded out, a Caterpillar D8 tractor with dozer cleaned up around the shovels. Another D8 dozer maintained the spoil area.

Concrete structures

This past season, concrete work was done on the bulkhead, pumphouse, waterway section, and the pipe-gallery bulkhead section. The 102-foot-long bulkhead is a typical gravity-type structure with an 83-foot-wide base tapering to a 32-foot-wide top. It supports a 24-foot roadway at a maximum height of 117 feet above bedrock. The 81-foot-long pumphouse, adjacent to the bulkhead, has two 48-inch pipelines to feed water from the canal to the four 10,000-gpm pumps. East of the pumphouse is the 119-foot waterway section with four 15x30-foot vertical lift gates powered by individual hoists, each with a capacity of 100 tons, that were supplied by Pacific Coast Engineering Co. The 55-foot-long bulkhead section is similar in cross section to the west bulkhead. This section of the intake, completed this past season under stage one construction, runs in a northeasterly direction. The remaining length, which will be similar to the pipe-gallery bulkhead, will bend so that it will be perpendicular to the flow of the canal.

This will block the canal flow, causing the water to swing into the excavation

made during stage one, then run through the waterways. Pipelines, carried from the pumphouse to the opposite shore, will run through the pipe gallery, under the roadway and through the bulkheads, to connect with an existing water main supplying Massena. When the structure is completed next October, it will have two earth-filled dikes on either end to serve as approach roadways. On the Massena or west side of the intake, the dike will be 3,000 feet long; on the opposite shore, the dike will be 165 feet long.

Concrete placing

Throughout the first stage of construction, the work area was kept free from seepage and from water used for curing by Rex 4-inch gasoline

pumps that fed a Fairbanks-Morse 4-inch electric pump. This pump discharged into a drainage ditch which fed a General Electric 4-inch pump that kept water flowing out of the excavation.

Two Manitowoc 4500 cranes with 140-foot booms and powered by Cummins diesels handled the concrete buckets during placing operations. Air for operating both the concrete buckets and the Malan air-operated vibrators was supplied from a compressor bank consisting of two Ingersoll-Rand 1,200-cfm air compressors. This air was fed to the work site through Naylor 4-inch diameter Spiralweld pipelines that were spaced so that a minimum length of rubber pneumatic lines had to be used. A second Naylor pipeline delivered water to the mono-



This network of ramps, takeoffs and high-way composes the three mile stretch of New Jersey Turnpike extension worked by Geo. M. Brewster & Son, Inc.

REMARKABLE SELF-WIDENING FINISHER MAKES SMOOTH WORK OF COMPLEX HOLLAND TUNNEL EXTENSION OF JERSEY PIKE!



Flex-Plane's Triple Lap Frame provides unsurpassed steadiness even at its widest width. Here machine works 23' slab in extended position.

"There's only one machine that could have done this job," states Byron Craig, Paving Superintendent of Geo. M. Brewster & Son, Inc., "and that is Flex-Plane Self Widening Finisher."

The job Byron Craig was talking about is the New Bay-Hudson County Extension of the New Jersey Turnpike, a three mile stretch of ramps, turnoffs, interchange lanes and service area cutoffs that connects the toll road with the Holland Tunnel.

"This job was a real challenge," continues Craig, "typical pour would range from 4' to 14½' to 19', but to 15' - 8", then up again to 23'. The Flex-Plane Self Widener worked these variable width slabs as easily as though it were a straight pour. What's more I Flex-Plane builds a 'paving man's' machine. It's strong and sturdy at its widest width, and it comes in a wide selection that makes sense."

You'll find most leading paving firms own Flex-Plane finishers. It's the most popular finishing machine ever built. If you are in the market for finishing equipment let us put you in touch with a contractor in your area who'll convince you there's absolutely nothing to match it.



THE FLEXIBLE ROAD JOINT MACHINE CO.

9001 THOMAS ROAD, WARREN, OHIO

10083

WORLD'S LARGEST MANUFACTURERS OF CONCRETE FINISHING EQUIPMENT

CONTRACTORS AND ENGINEERS



Empty Gar-Bro 4-yard buckets are hauled back to the plant on a Euclid truck for refilling. Ten types of concrete are being supplied for this project.

liths for cleaning and curing purposes.

The Blaw-Knox prefabricated steel form panels used for 5-foot lifts on all flat surfaces, and the prefabricated plywood-faced forms for unusual or curved sections of the intake, were stripped after 24 hours so that concrete could be cured with Hunt Clear Cure and water.

Aggregate, cement handling

Concrete operations, started this past season, are now suspended until April or May. The second or final stage will be completed by October. The 180,000 cubic yards of concrete needed for the intake structure is being turned out by an automatic C. S. Johnson batch plant near the site.

Here, the stockpiles of sand, and ¾-inch, 1½-inch, 3-inch and 6-inch stone are fed by Omaha Standard 20-ton bottom and rear-dump trailers pulled by International tractors. These hauling units pick up the concrete aggregates from the Tecon Corp. quarry near Norwood, N. Y. As loads are dumped at the base of the proper stockpile, the aggregates are pushed to the top by a Caterpillar D8 tractor and dozer.

Running under the stockpile is an 8-foot-diameter reclaiming tunnel built of Armco corrugated plates and reinforced with 4-inch-diameter iron pipes spaced on 8-foot centers. This tunnel has two Johnson clamshell gates under each stockpile so that aggregates can be discharged onto a 30-inch U. S. Rubber belt that rides a job-built conveyor to a Symons vibrating screen and washer-shaker setup. Fines are removed from the stone by water supplied from a storage tank. This tank, which also supplies water for the batch plant operation and, via a direct and separate distribution system, for the cleaning and curing of monolith pours, is kept filled with water from the power canal by a Layne-Bowler 12-inch pump.

A flap gate allows sand to bypass the rinser and continue up a second U. S. Rubber 30-inch belt on an inclined conveyor. Aggregates leaving the rinser also continue up this 30-inch conveyor belt to the rescreens at the top of the batch plant. The rescreens consist of two Hewitt-Robins double-deck Gyrex vibrating screens, the top deck having 3½-inch-square openings, the second having 1½-inch openings, the third with ¾-inch openings, and the last with 3/16-inch-square openings. Material running off the top 3½-inch screen is classified as 6-inch stone; that going off the second deck, 3-inch stone; material from the third screen, 1½-inch; and material off the bottom deck, ¾ inch. Separate chutes take the material from each of the screens to separate compartments of the 400-cubic-yard capacity aggregate bin. Sand bypasses the rescreens and falls through a chute to the sand compartment. Material passing all the Gyrex screens is caught in a tub and flushed out to waste.

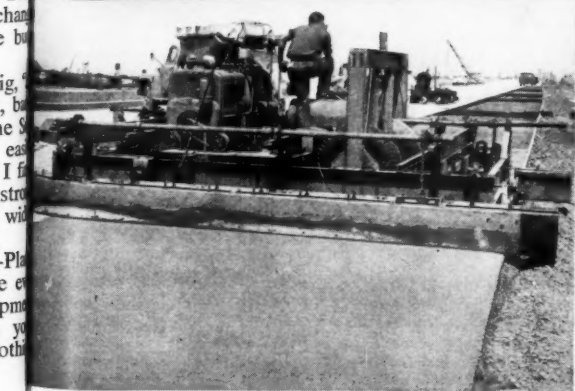
Batching

Cement, delivered in 100-barrel tanker-trucks and unloaded into a hopper that feeds a screw conveyor, is picked up by the 110-foot-high enclosed bucket elevator. It is deposited in the 4,800 or 800-barrel silos adjacent to the plant—or a third 400-barrel silo in the center of the aggregate bin—through a 3-way valve at the top of the elevator.

Compartment gates are opened simultaneously by means of a control-panel button. After the Johnson dry batchers—one for every ingredient—have been loaded with the correct weights of cement, stone, sand, and water, loading is stopped automatically through pull-wire connections between batchers and individual scales in the control room. Batcher gates are controlled by a second but-



Byron Craig, Paving Superintendent, shows type of progress chart he used to map pours.



Typical slab section. Note unusual tapering. Brewster was able to maintain above average pour with a single Flex-Plane machine without a spreader.

Here machine works narrow take off strip in contracted position. Three mile stretch had 10 such strips plus 8 ramps and one underpass.



For more facts, use Reader-Reply Card opposite page 18 and circle No. 239

ton on the control panel, so that the various ingredients fall simultaneously through a swivel chute into one of the three Koehring 2-yard tilting-type mixers. A typical 2-yard batch of 6-inch interior concrete consists of:

Portland cement	526 pounds
Sand	1,909 pounds
¾-inch stone	1,290 pounds
1½-inch stone	996 pounds
3-inch stone	1,460 pounds
6-inch stone	2,110 pounds
Water	240 pounds
Admix (Airin)	7 ounces

After a 2-minute mixing cycle, the mixer dumps to a wet batch hopper. The 2-yard batch is then dumped, by means of an air-operated release controlled by the dispatcher, to one of the two waiting Gar-Bro 4-yard concrete buckets. These ride on a Euclid truck converted to support the buckets.

About ten different types of concrete mixes are being used on this project, and all of them are being turned out easily by the plant. Actually, there are five variations in the concrete, but these are supplied in both interior and exterior mixes. A selector knob at the upper right-hand corner of the control board is used to set the Johnson scales that control the weights of materials loaded into the dry batchers.

Get ready for next season

A temporary bridge has already been built to span the canal, providing both a road for trucks hauling concrete and a means of transferring equipment to the opposite shore. A Koehring 605 crane with a Cleaver-Brooks 150-psi oil-fired steam boiler drove H-piles for the bridge.

Two cellular cofferdams are also being built in the canal, upstream and downstream from second-stage construction, so that the remainder of the intake can be built next year. Sheeting for this cofferdam is being positioned in a circular steel template and driven by a Manitowoc 4500 crane. The sheeting is being driven to rock with a McKiernan-Terry hammer. When the cofferdams are completed, water flowing in the canal will be diverted through the control-gated waterways built during stage one, and allowed to continue down the canal to the Alcoa hydro-power plant.

Personnel

John Armitage is the project manager, and Robert Brown, the project engineer for the joint-venture firms working on the Intake. Dee Henderson is the plant superintendent. Harold Boles is the resident engineer on the job for Uhl, Hall & Rich, Boston, Mass., the consulting engineers for the New York State Power Authority. Frank Matejka is the project manager and Ellis Armstrong, his assistant, for the consulting firm, which has supervision over all the power projects being built by the New York State Power Authority. **THE END**

Aluminum building materials accounted for 19 per cent of the products shipped by members of The Aluminum Association from January to June 30, 1956.

Impact wrench designed for cool running, speed

■ An impact wrench that is designed for cool running, durability, and speed, while delivering a steady output of power, is announced by The Black & Decker Mfg. Co. The tool, recommended for nut running, as well as for driving cap and lag screws, is said to be constructed with such ruggedness that service problems are practically eliminated.

The new power wrench weighs 7 pounds and delivers 1,800 impacts per minute. According to the manufacturer, it cannot be stalled or over-



Black & Decker's new impact wrench is designed to operate at a very cool running temperature.

loaded. Driven by a Black & Decker motor, its power output is the same in forward or reverse. A specially-designed centrifugal fan and ventilating system gives the tool a very cool operating temperature at all times, the manufacturer states.

The new wrench is said to reach its maximum torque in six seconds. By means of adaptors, numerous accessories can be attached to the tool. Drill bits of from 3/16 inch to 1/2 inch in diameter can be driven, as well as hole saws, masonry bits, and thread taps. A right-angle head attachment is also available.

For further information write to



TWO LOAD-SPEEDING International "95" Payhauler average 2400 cu. yds. of rock per



TWO-TON CHUNKS OF LIMESTONE bang down into the huge Payhauler body—the rugged high-tensile steel sides, triple-section bottom, and super-duty "spring cushions" are built to take rock-shock! And the "95" Payhauler frame is strongest known of any off-highway truck in its class.



WITHOUT LOSING A SWING, 3 cu yd shovel always finds "95" waiting for load. Powerful, fuel-saving 335 hp Turbo-charged diesel engine keeps power high, reduces fuel consumption 10% or more. Maximum engine torque is transmitted efficiently through new cerametallic clutch and shock-saving planetary final drive into greater pay-off work power!

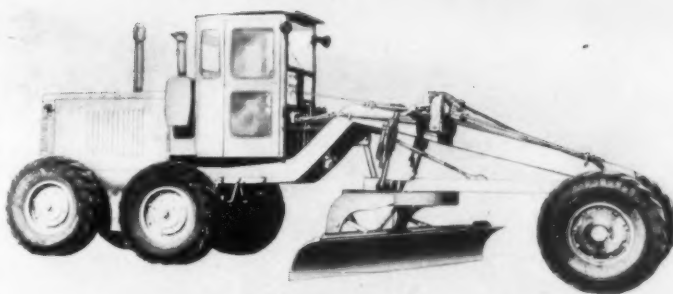


BODY UP... DOWN... IN ONLY 12 SECONDS! Three-stage, double-action hydraulic hoist provides full-time power control. Built-in hydraulic snubber valves assure smooth, over-center dumping action and gentles body return. Proper weight distribution permits safe dumping at edge of fill, yet drive wheels carry ample weight for steep-grade traction.

The Black & Decker Mfg. Co., Joppa Road, Towson 4, Md., or use the Request Card at page 18. Circle No. 60.

Canadian Clark plant

Canadian Clark, Ltd., St. Thomas, Ontario, Canada, a branch of Clark Equipment Co. of Benton Harbor, Mich., has opened a new manufacturing plant. The plant, which occupies 52,000 square feet of space, is now producing three models of the rubber-tire Michigan tractor shovels, ranging in capacity from 1 to 2 1/4 cubic yards. In 1957 the Model 12-B tractor-shovel will also be made there.



Hi-Speed moldboard shock absorbers are designed to increase the life of a motor grader, its tires, and its blade.

Moldboard shock absorbers fit most standard graders

■ Moldboard shock absorbers that are said to enable a motor grader operator to maintain road speeds of up to 12 mph is announced by the Over-Lowe Co. The Hi-Speed moldboard shock fits most standard graders.

Other advantages said to result from using the shocks include the reduction of high-speed grader "bounce", since operators no longer have to fight the controls; the ability to plow snow off gravel and hard-surface roads without damaging the surface; and the maintenance of shoulders on asphalt and concrete roads without damage.

The shocks also reduce the wear and tear on the grader, according to the company, because they bring about a floating action in the blade. This is said to increase the life of the grader and reduce downtime. Tires can be run with the proper air pressure at all times.

For further information write to the Over-Lowe Co., P. O. Box 2879, Denver 1, Colo., or use the Request Card at page 18. Circle No. 33.

Concrete-placing machine has remote control unit

■ A remote-control hookup is now available for the Jetcrete, a machine used for placing concrete pneumatically, according to Engineered Equipment, Inc., the manufacturer. The unit eliminates the need for a gun tender.

After the Jetcrete hopper is filled, the remote-control unit is set within reach of the nozzleman. He then can



easily operate the gun's starting and stopping controls.

The unit is designed for use with Jetcreters powered by electric motors: the Model 240 with a capacity of 5 cubic yards per hour, and the Model 240 modified with a 6.5 cubic yards per hour capacity. The unit operates on a 110-volt circuit.

For further information write to Engineered Equipment, Inc., 1001 Linden Ave., Waterloo, Iowa, or use the Request Card at page 18. Circle No. 87.

Baker-Raulang move

The Dallas, Texas, branch office of the Baker-Raulang Co. has moved to a new building at 1703 Levee St. in Dallas. The new location provides facilities for stocking parts, servicing, and demonstration.

At the same time, M. S. Stevenson was named manager of the Dallas branch.

—For more facts, circle No. 240

Payhaulers

per 10-hour day!

NO FOOT-BRAKING DOWN-GRADE! Heap-loaded "95" Payhauler rolls along safely down to the fill at 10 mph. Hand-operated Torqmatic brake, "torque converter in reverse" is standard equipment, gives accurate, confidence-building control at any speed...on any grade. Earl

and Roy Schenewerk, operators of the "95's" say, "Because of Torqmatic brakes, these Payhaulers operate easier, smoother and safer than any other unit we've ever driven. Now, we have no worry on this steep grade."



"Best Production I've ever had,"

Says H. D. BROWN
Project Superintendent,
Clarkson Construction Co.,
Kansas City, Mo.

High speed (up to 38 mph.), 16 cu yd capacity, and next-to-automatic operating control of two new International "95" payhaulers are getting Clarkson Construction Co. record-breaking rock production of 2400 cu yds per 10-hour day. Payhaulers are producing this outstanding yardage on the company's 1000-foot cut through dolomite limestone—part of their 7.5 mile, 2-lane highway contract between Bonne Terre, and Halifax, Mo.

The Payhaulers are operating on a 2000-foot cycle which includes a 12% grade. On this grade, too tricky and treacherous for Clarkson's other rock haulers, Payhaulers maneuver speedily and safely downgrade—under positive Torqmatic braking control! Payhaulers'

high speed of up to 38 mph also permits the fast average round-trip travel time of only 2 min, 45 sec. That's faster than the 3 cu yd shovel can load one!

H. D. Brown, Project Superintendent, says, "The Payhaulers have got all other rock trucks beat. Control we've had with Payhaulers on this job is something we didn't have on any other truck. We've averaged 150 to 162 loads of 16 to 18 cu yds per 10-hour day. It's the best production I've ever had!"

Other veteran rock men who have used or seen the International "95" Payhauler in action say the same thing. You'll join them, too! Ask your nearby International construction equipment distributor to give you a demonstration.



INTERNATIONAL Construction Equipment

International Harvester Company, 180 N. Michigan Avenue, Chicago 1, Illinois

A COMPLETE POWER PACKAGE INCLUDING: Crawler, Wheel, and Pipe-Boom Tractors . . . Self-Propelled Scrapers and Bottom-Dumps . . . Crawler and Rubber-Tired Loaders . . . Off-Highway Trucks . . . Diesel and Carbureted Engines . . . Motor Trucks



This Cedarapids crushing plant produces 150 tons of base materials per hour. The primary feeder, right, delivers material to a 24x36 jaw crusher, and an inclined conveyor carries it to a two-deck screen. Oversize passes to a hammermill.

Rock cuts and long hauls make for tough grading job



One of the many Davis trucks equipped with RCA Radio and, inset, dispatcher talking to truck on location.

"We save thousands of dollars every year with RCA 2-Way Radio!"

President Al Davis, youthful head of the Davis Construction Corp., Hicksville, N. Y., has been sold on RCA 2-Way Radio since its installation. Says he, "Our radio system has proved absolutely invaluable in meeting schedules. We save thousands of dollars every year by eliminating unnecessary travel. We dispatch equipment directly from job to job, reschedule it in emergencies, call it in—without the expense of idle time. On the basis of our hourly costs RCA 2-Way Radio paid for itself in less than a year by saving at least an hour a day." By saving manhours and equipment time, this progressive company has been able to step up its profits. The efficiency of the entire company has increased since they got radio. Why don't you use RCA 2-Way Radio?

Why are the leaders choosing RCA?

They are impressed with RCA's fine service organization and the years of RCA leadership in radio and electronics. Superior tubes, crystals and microphone for clearer talking, longer life... heavy-gauge steel case for rugged use.



DISPATCHER

2-WAY RADIO

TO DRIVER

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RADIO CORPORATION of AMERICA

Communications Products

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In Canada: RCA VICTOR Company Limited, Montreal

- ☐ Please send me complete information on use of RCA 2-Way Radio in construction.
☐ Have RCA Communications Specialist make a FREE RADIO SURVEY of my business.

Name.....Title.....

Company.....

Address.....

City.....Zone.....State.....

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 241

The largest single construction contract ever awarded by the Missouri State Highway Department was let to the Porter-DeWitt Construction Co., Poplar Bluff, Mo., for the construction of 10.13 miles of four-lane divided highway on U. S. 66 east of Hazelgreen. The \$2,774,192.78 contract called for grading, structures, base, and concrete paving on a completely new alignment through the rocky Ozark plateau region of south-central Missouri.

Dividing the project into three major parts, Porter-DeWitt sublet the structure work to the Maxwell Bridge Co., Columbus, Kans., and the paving to Koss Construction Co., Des Moines, Iowa. The rough jobs of hacking out a new grade and producing and placing base material were done by the general contractor.

Deep cuts, large fills, long hauls, and an abundance of rock made the grading job particularly difficult. The contract called for excavation of 1,250,000 cubic yards of earth and 650,000 cubic yards of rock. Getting

excavated materials into place in the fills required 6.5 million cubic-yard-stations of overhaul. Thus, the average yard of material was hauled the 1,000 feet of freehaul plus nearly 350 feet of overhaul. Completing this large a job in time to permit paving to be done during the same construction season required a large spread of equipment, a carefully planned operation, and long hours of work.

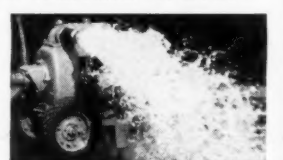
U. S. Route 66, often referred to in this area as the "Main Street of America", is one of the principal routes between Chicago, St. Louis, and Los Angeles, and carries a great deal of cross-country traffic.

The highway, being constructed by the Missouri State Highway Department, cuts diagonally across Missouri from St. Louis on the east to Springfield, and then on to Joplin on the Oklahoma border. Continuing west in Oklahoma, U. S. 66 may be used instead of the Oklahoma Turnpike to Tulsa or Oklahoma City. Through the middle of Missouri, the route penetrates the Ozark plateau region with



Jaeger pumps know how to handle water

Two independent, simultaneous priming actions... fast and doubly sure. • Oversize shells and impellers, engines of largest horsepower applicable. • The only positively lubricated shaft seal with ready inspection port. • Prime without racing, pump at slower speeds, pump more thousands of hours. Performance guaranteed. Sizes 1½" to 10". See your Jaeger dealer or send for Catalog P4.



THE JAEGER MACHINE COMPANY

701 Dublin Ave., Columbus 16, Ohio

COMPRESSORS • MIXERS • TRUCK MIXERS • SPREADERS • FINISHERS • LOADERS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 242

CONTRACTORS AND ENGINEERS

**Processed rock from roadway is used
in base course; highway, built on
new alignment, widened to four lanes**

C&E Staff Photos

Drills mounted on the front of a Caterpillar D8 are fitted with Timken carbide-insert bits for the rock-blasting operation. A Gardner-Denver 600-cfm compressor mounted on the rear of the tractor is powered by the tractor engine.



its rocky, wooded hills and deep valleys. The old highway had followed the ridges faithfully, making grades, curvature, and sight distances unequal to modern standards.

Built on new alignment

The new road, in many places on an entirely new alignment, is an almost continuous series of cuts and fills. Built on a minimum 200-foot right-of-way, the road was made into a four-lane divided highway with two 24-foot concrete roadways separated by a 40-foot depressed median. Each roadway is bounded on both sides by 10-foot stabilized shoulders with 4 to 1 shoulder slopes leading to wide flat-bottom ditches. Backslopes in both cut and fill are 2 to 1 except in rock cuts.

(Continued on next page)



Large rocks in cut areas—typical on this job—are loaded by a Lorain 820J shovel to a Euclid bottom-dump which will haul to the crushing plant. Euclid end-dumps handle rocks that are too large for the bottom dumps.

**LIFT OBJECTS
QUICKLY—
SAFELY...**

**ANY
SHAPE
OR SIZE!**

with
Downs SAFETY GRABS
for Cranes and Hoists



PILE BAND PULLER

Now you can tailor your lifting equipment to "fit" any shape or size materials to be moved with Downs Safety Grabs. No matter what your hoists are handling—pipe, rails, drums, plate or structural steel, stone, timber, boxes or odd-shaped objects of any size—there's a Downs Safety Grab designed for the job.



RIPPING HOOK

Downs Safety Grabs give you faster, easier lifting... and they're safety-engineered to provide a wider safety factor than listed capacity ratings. They can't let go until you release the load—real protection for workers that improves morale.



BEAM TONG

Write for FREE illustrated catalog 2008-B for complete information on every model—today!



PILE POINT & BAND

Downs
"THE GRIP
that
NEVER GIVES"



PILE PULLER

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MECHANICAL ENGINEERS
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For more facts, circle No. 243



TESTING?

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You take 14 men and what do you get?

In 1914 when this first Rogers commercial trailer was built, 14 men constituted an appropriate load test.

42 years later it is still an "iron bound" Rogers policy to load test their vastly improved current models under actual hauling conditions.

You'll find a liberal safety factor in every Rogers Low-Bed Heavy Duty Trailer today.

*Introducing "PACKY" the pack mule, the traditional load carrier in the old "four legged" field. He is a natural kibitzer and sometimes envious commentator. We'll have to contend with him for a while at least, unless he lets his mulish traits get the better of him.



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ROGERS BROS. CORP. ALBION, PENNA.

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A Ferguson tractor with a Pippin hoe digs an 18-inch trench through the subgrade for a Helicor perforated underdrain pipe. The tractor is equipped with a Davis front-end bucket loader.

(Continued from preceding page)

After a spread of Caterpillar D8 tractor - dozers had cleared and grubbed the right-of-way, grading crews began to move some of the dirt, exposing the rock in the big cuts. Earthwork was handled by several spreads of scrapers, including six Caterpillar D8 tractors pulling Cat 80 scrapers, two D8's with LeTourneau LP scrapers, and a spread of new Euclid 16-yard scrapers. Pushers included a McCoy Special Caterpillar, two standard Caterpillar D8's, and an Allis-Chalmers HD-21. Several D8's

with dozers helped place the material and shape the fills, while five Caterpillar D6 tractors with sheepfoot rollers handled the compaction. Six Caterpillar No. 12 graders finished the subgrade and base and maintained the haul roads.

Center line cuts ran as deep as 45 feet, and the deepest center line fill was 50 feet. Slope stakes on some of the side-hill cuts indicated depths of 80 to 90 feet. The maximum fill at a shoulder location was 71 feet, while five of the big fills were in the 40-foot range. Transporting the material from the cuts to the fills required long hauls; much of the material from the largest cut was hauled 6,000 feet.

Rock excavation

Getting the big rock cuts out soon enough to permit the paving to proceed without interruption also posed a problem. Several rock cuts were operated at the same time so that all available equipment could be used. Rock soft enough to be ripped was scarified by two LeTourneau K-30 rippers pulled by Caterpillar D8 tractors and then loaded and hauled by the scrapers.

Shovels and haul units removed solid rock that had been drilled and blasted. The rock was a conglomerate of dolomite, chert, and sandstone, which proved to be more difficult to handle than the dolomite. Drilling was done by a variety of machines including six wagon drills and three tractor-mounted drills.

The three tractor drills, mounted on Caterpillar D8 tractors, were self-contained units, the tractor engine

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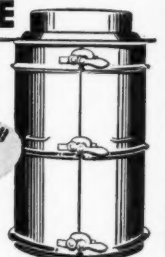
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For more facts, circle No. 246

CONTRACTORS AND ENGINEERS



Compaction of base material is done by a Bros 13-wheel pneumatic roller pulled by an International ID-9 tractor. The base was finished about an inch high on each side so that the form trencher could always operate in the cut.

operating a rear-mounted compressor while adjustable arms at the front handled two drills. One of the rigs had a Gardner-Denver 600-cfm compressor and a pair of Gardner-Denver drills; another had a Joy 500-cfm compressor with Joy drills. The third had a LeRoi-Cleveland 500-cfm compressor and drill attachment.

In addition to these self-powered rigs, there were four Ingersoll-Rand X71 wagon drills and two Cleveland wagon drills. Air for these drills was supplied by two Ingersoll-Rand Gryo-Flo 600 compressors. All of the drills used 2 1/4-inch Timken carbide-insert bits.

Because the blast holes were wet, they were loaded with Du Pont and Atlas 40 per cent gelatin dynamite at rate of about one pound of dynamite per cubic yard of rock. Charges were fused with Du Pont delay caps numbers 0 to 6 for good definition

along banks and to reduce the intensity of the blast near buildings. This conglomerate rock made it extremely difficult to get good definition of the edges of the cuts and to break the rock into pieces small enough for the shovels to handle. After the cuts had been completed, a trimming crew used three breaking hammers powered by an Ingersoll-Rand 315-cfm compressor to dress up the rock banks.

Base material from roadway cut

Of the four shovels, including a Lorain Model 820J 2-yard unit, loading broken rock from the cuts, two worked in one of the cuts where material was being crushed for base. Four Euclid bottom-dumps and three end-dumps hauled from the two large shovels, and trucks hauled from the

small shovels to the crushing plant.

The 4-inch compacted rock base under the pavement and extending a foot beyond the concrete slab on each side required 75,000 tons of crushed rock, which was obtained from one of the roadway cuts. It was loaded into trucks by two shovels and hauled to the crushing plant set up adjacent to the cut.

The Cedarapids two-stage crushing plant had a capacity of 150 tons per hour. The trucks hauling the raw material dumped into a Universal apron feeder which passed the rock on to a Universal 24x36 jaw crusher driven by a Caterpillar engine. A conveyor carried the crushed material from the primary crusher to a 42-inchx5-foot double-deck screen.

Oversize from this screen flowed by

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For more facts, circle No. 247

gravity to a Cedarapids hammermill secondary crusher driven by a Caterpillar D17000 engine. The conveyor from the hammermill was arranged in closed circuit with the screen. Crushed material passing the screen went by conveyor to a surge bin, and a second conveyor carried it from the surge bin to a fleet of White dump trucks that hauled to either the road or to stockpiles.

In the rock-cut sections, dozers scratched out the loose rough material, and the scrapers that hauled it

to fills brought back finer material suitable for finishing. More than 10,000 linear feet of perforated pipe underdrains was installed at intervals under the roadway. A Ferguson tractor equipped with a Pippin hoe attachment did much of the ditching for underdrains, and then, using a Davis front-end bucket loader attachment, filled the trench after the pipe had been installed.

Roadways were brought to final shape and grade by Caterpillar No. 12 motor graders. This subgrade was

then rolled by a Galion 10-ton tandem roller before the base material was applied.

The crushed-rock base material was loaded from stockpiles by a Caterpillar D4 equipped with a Traxcavator and an Allis-Chalmers HD-5 with a 1½-yard Tracto-Shovel. Trucks hauled the material to the roadway where it was spread by motor graders to build the 26-foot-wide 4-inch-thick base. Water, hauled from the Gasconade River in three 1,500-gallon water tanks on Ford trucks, was

sprinkled on the rock to bring the moisture content up to optimum. Compacted by a Bros 13-wheel pneumatic roller pulled by an International ID-9 wheel tractor, the base was laid about an inch high at both edges of the roadway, so that the paving contractor's form trencher would always be working in cut.

The paving of this stretch, done under a subcontract by Koss Construction Co., Des Moines, Iowa, was started late in the year. Despite this, paving crews were able to finish their jobs before cold weather moved in. (See "Twin pavers set pace on 21-mile paving job", page 76.)

Personnel

In order to complete the work in one season, the grading usually was done in two 10-hour shifts six days per week. Floodlights, powered by eight Kohler 1.5-kw light plants and a Caterpillar 15-kw generator set, provided illumination for the night shifts.

Superintendent of the project for the Porter-DeWitt Construction Co. was Fred Pulliam, and equipment superintendent for the operation was Irvin Rubottom. Shift foremen were J. P. Elrod and Edward Marks. The contractor's field headquarters was a mobile office custom-built by Indian Trailer Corp., Chicago. Resident engineer for the Missouri State Highway Department on the project was Dale Carney, who was assisted by Bob Meyers.

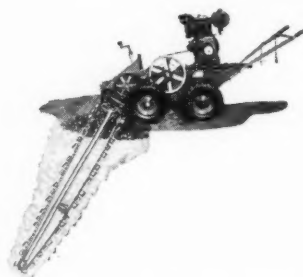
The project was done under the supervision of the Springfield District, of which G. E. Wolf is district engineer. Rex M. Whitton is chief engineer of the Missouri Department, and J. J. Corbet is engineer of construction.

THE END

Tire-mounted trencher completely portable

■ A completely portable trenching machine that can power itself up a ramp onto a pick-up truck is available from Brown Mfg., Inc. The unit is recommended for placing electric cable, gas lines, water lines, and telephone cable.

The rig is said to be capable of cutting a 3-inch-wide trench to a depth



of 5½ feet, a 4-inch-wide trench to a depth of 3½ feet, and a 6-inch-wide trench to a depth of 2½ feet. The cutting blades are of tool-steel quality and are hard-faced. According to the manufacturer, maintenance costs on the trencher are exceedingly low.

For further information, write to Brown Mfg., Inc., Woodbine, Iowa, or use the Request Card at page 18. Circle No. 64.

CONTRACTORS AND ENGINEERS



Here's what high-speed on rubber can do for you

Tournatractor, with 17 mph forward speed and 8 mph reverse speed, can do many tractor jobs twice as fast as a crawler-tractor.

Drives anywhere

Because of its big low-pressure tires, Tournatractor drives anywhere under its own power. Job-to-job moves can be made across pavement, over curbs, sidewalks, and railroad tracks. On long moves it saves time, bother, and expense of locating a trailer, moving in extra manpower and transport equipment, loading and unloading.

Reduces maintenance

Tournatractor greatly reduces maintenance and service costs by eliminating some 500 wearing parts that grind through dirt in a crawler-track assembly. Eliminated also is the friction caused by grit-grinding in the track assembly which reduces rated horsepower.

Easy to operate

With simple, easy-to-handle, power controls, and comfortable, adjustable, foam-rubber seat, operator on

Tournatractor works comfortably, with less fatigue, maneuvers faster, gets more work done, in less time, with less effort.

High-speed performance

Constant-mesh transmission eliminates delays in changing gears... saves vital momentum... gives any gear-ratio instantly. As a pusher or dozer, Tournatractor high-speed reverse (up to 8 mph) is a very important time saver.

Versatility helps get more work done

Wide range of attachments increase Tournatractor range of applications, extend length of work season. Since Tournatractor is a "traveling man", these optional attachments are especially important in finding profitable jobs in a wide range of big or small industries and in any climate or area selected.

a. Equipped with Bulldozer or Angledozer blade, Tournatractor push-loads scrapers, moves short-haul dirt, cleans up at shovel, loads and spreads on dump, digs drainage ditches, maintains haul roads, clears land, terraces, digs

Four-wheel drive, and tires 2' wide, give Tournatractor ample traction to make full use of its 208 hp.



Root-Rakes

stock piles, grades roads. Does all these jobs fast.

b. Root-Rake makes 208 hp Tournatractor a powerful tool for clearing brush, grubbing roots, raking out boulders, etc. The 11¼" wide x 4'6" high rake has 10 teeth of 4" high-grade steel, to resist shock, do heavy work.

c. Tree-pusher attached to Tournatractor, reaches high on tree with 32' forked boom, provides extra leverage to push trees down fast. Boom angle creates down-pressure on tires, increases traction, helps remove more trees in less time.

d. Tournatractor with drawbar attachments does wide variety of chores—keeps working at 100% availability. Pulls scrapers, sheepsfoot rollers, rosters, and other drawn equipment.

Ask for owner-verified job reports on work similar to yours.



Tree-pusher

Tournatractor, Angledozer, Roster—Trademark Reg. U.S. Pat. Off. T-954-G-bw



LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS

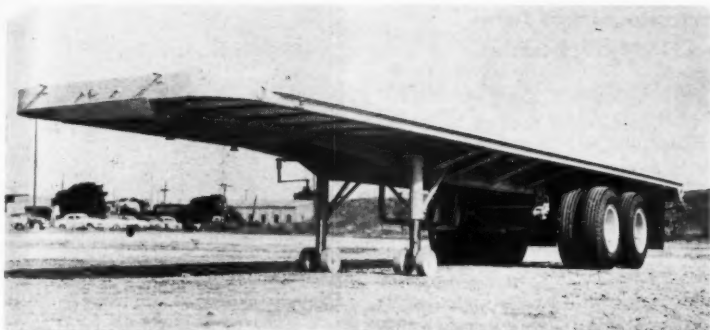
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See you at the ROAD SHOW • Chicago • January 28-February 2, 1957

For more facts, use Reader-Reply Card opposite page 18 and circle No. 249



The new member of the Hobbs K-series platform trailers.

Platform trailer usable both on highway and off

■ A heavy-duty platform trailer, said to be rugged enough for handling concentrated loads off the highway yet light enough for moving legal payloads along the road, is announced by Hobbs Trailers. The new member of the Hobbs K-series platform trailers is available in lengths of from 33 to 41 feet.

The rig has a rated capacity of 45,000 pounds and weighs 10,849 pounds. According to the manufacturer, a conventional float trailer long enough to provide the distributed load capacity of the Hobbs rig would have to weigh nearly 14,000 pounds.

The unit's center frame is a 12-inch I-beam of high tensile steel. The center section is strengthened by eight knee braces between the center frame and the outer frame rail, four to a side. Other features are a folding king-pin for use with a two or three-axle truck and a two-speed landing gear.

The new trailer, with its ability to handle either concentrated or distributed loads, is recommended for movers of steel, concrete blocks, brick, and heavy machinery.

For further information write to Hobbs Trailers, 609-33 N. Main St., Fort Worth 1, Texas, or use the Request Card that is bound in at page 18. Circle No. 51.

Clip board attaches to underside of dash

■ A metal clip board that attaches to the underside of the dashboard of a vehicle and swings out for use as a portable desk is announced by the General Industrial Co. The Travel-Desk measures 6¼ x 10 inches and is available with a magnetic mechanical pencil.

A strong arm and clamp make the Travel-Desk perfectly rigid, the manufacturer reports. It is installed without drilling and may be attached to or removed from the dashboard quickly. Four leveling screws permit the unit to be adjusted to the proper writing angle no matter what the shape or slant of the dashboard.

The Travel-Desk is recommended for use by construction supervisors, foremen, engineers, material-handling truck operators, or anyone required to make written notations while operating a vehicle.

For further information write to the General Industrial Co., 5742 N. Elston Ave., Chicago, Ill., or use the Request Card at page 18. Circle No. 39.

Diesels now available on two tractor shovels

■ Diesel engines manufactured by the Detroit Diesel Engine Division of the General Motors Corp. are now available as optional power plants on two models of the Michigan tractor shovel line, according to the manufacturer of the line, the Construction Machinery Division of the Clark Equipment Co.

The Michigan 175A is now available with a Detroit Model 4-71 diesel. Rated at 147 brake horsepower at 2,200 rpm, the 4-cylinder engine has a displacement of 283.7 cubic inches. Maximum torque is 366 foot-pounds at 1,600 rpm. With the new engine,

the Model 175A weighs 24,550 pounds.

Detroit Diesel's Model 3-71 is offered in the Michigan 125A tractor shovel. The 3-cylinder 212.8-cubic-inch engine is rated at 105 brake horsepower at 2,200 rpm. Maximum torque of 275 foot-pounds is reached at 1,500 rpm. Weight of the Model 125A with the diesel is 19,340 pounds.

For further information write to the Construction Machinery Division, Clark Equipment Co., P. O. Box 599, Benton Harbor, Mich., or use the Request Card that is bound in at page 18. Circle No. 83.



Versatile, truck mounted LIMA 44 crane speeds freeway construction for Grove, Shepherd, Wilson & Kruege of California, Inc.

This 25-ton Lima Type 44 truck crane is helping to construct the West Coast's largest double deck freeway, at Oakland, California. Owner Grove, Shepherd, Wilson & Kruege of California, Inc., uses it for a variety of heavy duty lifting jobs . . . transferring concrete from truck mixers to hoppers on the bridge deck (shown above); lifting heavy forms, steel and other materials. They report:

"This rugged Lima is tops for the tough assignments that call for a sturdy, dependable machine that stays on the job. It gives us fast, smooth, precise lifts every time. Downtime is no problem, so operating costs are low."

The Lima Type 44's truck mounting pays extra dividends, too. Traveling under its own power, at automotive speeds, the machine gets from job to job fast. On the job, the Lima's oscillating tandem type rear axles make it highly mobile off the highway, too . . . and they make for firm working footing on uneven terrain. Grove, Shepherd,

Wilson & Kruege concludes: "The Type 44's fast travel speed and mobility let us use it to serve widely separated jobs quickly and economically."

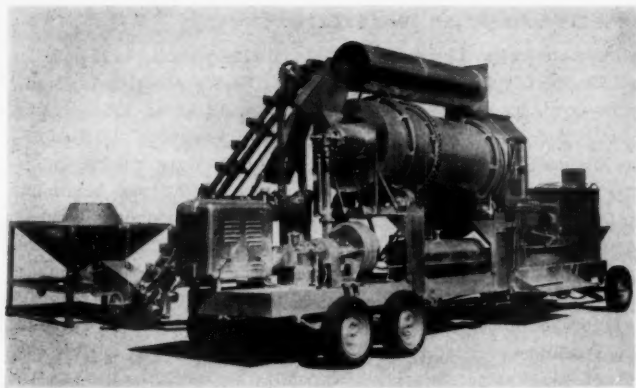
You, too, can rely on Lima's quality design and construction to insure top service on *your* jobs. These ruggedly built, fast-working machines guarantee you top output at lowest operating cost. Quality pays . . . and Lima quality *pays off for you!* Find out about it from your nearby Lima distributor, or write Construction Equipment Division, Baldwin-Lima-Hamilton Corporation, Lima, Ohio.

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 250



Asphalt plant available—stationary or portable

■ A new asphalt plant rated at 20-tons-per-hour of hot-mix with a 1,000-pound-capacity batch mixer, is announced by the White Mfg. Co. The plant is available as a portable or a stationary installation. It has been designated as the Model L-10.

The plant has a dryer drum that measures 46 inches in diameter x 10 feet in length. A two-compartment divided feeder which can be built up to carry a large quantity of aggregate is supplied. It has a reciprocating plate driven from the lower end of the bucket elevator.

All equipment on the L-10 is driven from a single power unit, either a 50-hp engine or a 30-hp electric motor. A built-in air compressor supplies air for the control gates of the dryer drum, the volumetric aggregate measuring hopper, and the pug mixer.

The L-10 comes with a 220-gallon asphalt heating kettle. While a bituminous distributor or stationary tank is generally used, the auxiliary asphalt supply source need be heated only hot enough to pump, the manufacturer points out; final temperature can be secured in the plant tar kettle. On the dryer, a low-pressure burner operates on either fuel oil or natural gas.

The hourly rating is based on a discharge temperature of 300 degrees F on an average 70-degree day using an aggregate with 5 per cent initial moisture. The plant can be used for cold mix also, or for any other bituminous formula.

For further information write to the White Mfg. Co., 1227 W. Beardsley Ave., Elkhart 9, Ind., or use the Request Card at page 18. Circle No. 63.

Rock ripper

■ The Ateco rock ripper for mounting on Caterpillar D6, D7, D8, and D9 tractors is featured in a catalog from the American Tractor Equipment Corp. Equipped with positive hydraulic control and curved gooseneck shanks, the unit can dig to depths of 30 inches. A sub-soiler shank (optional) that can rip to a depth of 48 inches, is diagrammed. Job photos and specifications are included.

To obtain the catalog write to the American Tractor Equipment Corp., 9131 San Leandro Blvd., Oakland 3, Calif., or use the Request Card at page 18. Circle No. 5.

Portable ramps form roadway over hoses

■ A portable ramp that permits traffic to roll over any type of hose or electrical line up to 4 inches in diameter is announced by the Copperloy Corp. The ramp is made of magnesium and is constructed to support loads of from 5 to 20 tons, the company reports.

The ramps are used in pairs, held together with neoprene belting. The belting separates the two ramp sections, permitting the hose or power line to be dropped in between them. Special filler strips are available for



use where multiple hoses must be crossed.

Each 5-ton section measures 16 x 36 inches and weighs 20 pounds. The

TS-18 "Eucset"

TWIN-POWER SCRAPERS get more work done... faster



Twin-Power—two engines driving separate axles—was pioneered by Euclid 10 years ago. Torque converters and semi-automatic transmissions assure easy operation and a smooth flow of power matched to any job condition. The TS-18 is powered by two 218 h.p. engines with a 300 h.p. engine for the tractor available for work where maximum power can be used. Standard tires are 27.00 x 33 with 33.5 x 33 as optional. Harris Construction Company's "Twins" are TS-18 Specials with 518 h.p. and the larger tires.



With a total of 518 h.p.—300 h.p. in the tractor and 218 h.p. in the scraper—Harris' TS-18 Specials really made the dirt fly and completed the Glasgow Air Force Base grading weeks ahead of schedule.

Harris Construction Co. of Aberdeen, S. D. recently set a new record for earthmoving on Montana highway work with a fleet of six TS-18 Euclid Scrapers. In a six-day work week these "Eucs" moved 90,000 cu. yds. on a half million yd. road contract near Nashua on Route 2. They worked 10 hours a day—self loaded gravel, clay and shale without pusher tractors—on hauls averaging 1500 ft. Most of the time each machine worked alone making shallow cuts and fills on sections of the 13-mile job.

At nearby Glasgow Air Force Base, Harris used his original fleet of four TS-18 "Eucs" to move most of the 1,200,000 yds. of gumbo. Working two 10-hour shifts 6 days a week, each scraper averaged 69,000 yds. a month. Performance of the "Twins" on this air base job was so outstanding that 2 more were added to the Euclid fleet—and Harris has disposed of 8 other scrapers and 5 crawler tractors.

With two jobs only 26 miles apart the mobility and independence of the TS-18 Scrapers proved a big advantage. They moved from air base to road job and back again—as conditions required—in about an hour. There was no problem or expense in moving pusher tractors because none were needed at either job. And when a few loads of sand or gravel were needed for culverts or other use, a "Twin" or two took off for the nearest pit and did the job in a hurry.

Owner Ken Harris has found the Twin-Power Scraper the most efficient dirt mover he's ever used. His fleet with job availability of 95% has more than lived up to his expectations in production and low cost yardage. That's why he tells visitors to his jobs, "When I buy additional haulage equipment it'll be TS-18 'Eucs'".

For information on the complete line of Euclid earthmoving equipment, call your Euclid dealer—he can show you why Euclids are your best investment.



top surface incorporates a diamond safety tread that provides good traction in all weather, according to the manufacturer.

For further information write to the Copperline Corp., 4173 Brookpark Road, Cleveland 29, Ohio, or use the Request Card at page 18. Circle No. 54.

Warner & Swasey news

William F. Cook has been appointed assistant general manager and Harry V. Bryan has been named director of purchasing for the Warner & Swasey Co. Duplex Division in Lansing, Mich.

Portable electric hammer uses shock waves to drill

■ A portable electric rotary hammer which uses shock waves to drill is announced by the Demo-Haines Tool Corp. The Demo-Haines high-frequency hammer creates more than 36,000 shock waves per minute to cut a hole up to 40 feet in depth through the hardest material, including reinforced concrete, the manufacturer reports.

Designed for drilling holes from 3/16 to 1 1/2 inches in diameter, the 10-pound hammer is recommended for overhead and horizontal drilling.



The new Demo-Haines rotary hammer.

It features a high-speed water and air swivel and a Thor electric motor that runs on 115-volt ac or dc current at 1,000 rpm. The hammer measures 16 inches long and delivers 6,000 blows per minute. It requires no transformer or rectifier.

For further information write to the Demo-Haines Tool Corp., N. 10th Machine Works, Enid, Okla., or use the Request Card at page 18. Circle No. 80.

Cement mortar admixture increases bond strength

■ A polyvinyl acetate concentrate that is said to increase the bond, tensile, and impact strength of portland-cement concrete up to 10 times is announced by Surface Engineering Co., Inc. Concrete surfaces containing Tite-Crete are also more resistant to corrosive chemicals and are less alkaline, the manufacturer reports.

Tite-Crete is recommended for use in repairing or resurfacing broken concrete surfaces. It is claimed to be especially valuable when applying thin layers of concrete. The concentrate emulsion is added to the regular mix in place of some of the water normally used.

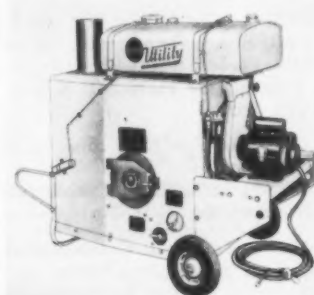
The admixture is also recommended for use in mortars and plasters, in manufacturing concrete products, and as a cement paint additive. In the latter capacity, it is said to improve the mixing, application, water repellancy, and bond of the cement-base-type paints, and to reduce chalking.

For further information write to Surface Engineering Co., Inc., 1535-37 Barwise Ave., Wichita 1, Kans., or use the Request Card at page 18. Circle No. 32.

Portable space heaters feature simpler controls

■ Seven improvements making possible simpler controls and safer operation are featured in the 1957 line of Herman Nelson portable space heaters, according to American Air Filter Co., Inc., the manufacturer. Both oil and gas-fired units are included in the line.

Capacities of from 50,000 to 450,000 Btu per hour are represented in the 1957 line. The low-cost Thrifty model



is powered by a 1/3-hp electric motor. The Utility model features interchangeable gasoline engine and electric motor. The De Luxe model is an all-automatic unit with optional remote temperature control.

For further information write to American Air Filter Co., Inc., 215 Central Ave., Louisville 8, Ky., or use the card at page 18. Circle No. 96.

For more facts, circle No. 251

Set new earthmoving records

... complete tough jobs way ahead of schedule



On one section of this Montana highway job a TS-18 working alone averaged 450 yds. per hour. Haul was 200 ft.—heaped loads of 17 bank yards were picked up in less than a minute.

The 33.5 x 33 tires and NoSpin differentials of the TS-18 Specials provided the tremendous traction needed for self-loading the heavy gumbo and gravel and made efficient use of the 518 total h.p. on both of the Montana jobs.



Ken Harris, head of Harris Construction Co. in South Dakota, says "the complete independence of the 'Twin' is revolutionizing road building on many jobs where concentration of equipment in any single cut is not practical." He's standardized on the TS-18 Special for his earthmoving equipment.



Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE



avoid legal pitfalls

Liability for defects after job acceptance

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Edited by A. L. H. STREET Attorney-at-Law

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SILENT GLOW

Model M offers Big Savings on BIG JOBS

1,000,000 BTU PORTABLE HEATER

Wt. 700 lbs.
Length 8'9"
Height 4'
Width 34"



For those big jobs that demand safe, high velocity, high temperature heat in enormous quantities, Silent Glow's Model M 1,000,000 BTU Portable Heater is the answer . . . especially for large industrial buildings, foundation and bridge work. It actually delivers up to 7000 CFM of safe, recirculating heated air, where you want it, at the flick of a switch.

Because of its high BTU capacity, one Model M eliminates the need for several smaller units . . . reduces initial costs, service costs and attendant costs on larger construction jobs.

Backed by 33 years of Combustion Engineering "Know How", The Silent Glow Model M is designed for efficient, simple, low cost operation. Rugged all steel, electrically welded body is built for years of trouble free service. Heavy duty rubber tired wheels make it extremely portable for its size (weight only 700 lbs.) and

capacity. Fuel consumption is 7.00 G.P.H. of No. 2 fuel oil, No. 1 fuel oil or kerosene.

One of the Model M features is the patented stainless steel Solar Glow Flame Filter combustion chamber . . . the exclusive combustion system which reburns noxious gases within the flame, insuring complete combustion. Other features include automatic temperature controls . . . overheating safety controls . . . replaceable fuel filters . . . low fuel cut-off.

REMEMBER . . . With the Model M you SAVE on initial cost, you SAVE on attendant costs, you SAVE on service and operational costs.

For complete details contact your Silent Glow Distributor or write, wire or phone



"Our 33rd Year"
SILENT GLOW OIL BURNER CORP.
876 WINDSOR ST., HARTFORD 1, CONN.

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Will New Roads Save Lives

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41,000 miles of new expressway will be built. They will be wider, safer roads. Crossings will be eliminated. If speeds are maintained, there will be fewer accidents.

ONE GOAL

Since 1949, Caterpillar, your partner in earthmoving progress, has campaigned for better highways

IKE SIGNS BIGGEST ROAD BILL EVER

Washington, D. C., June 29. Among some 50 bills signed by the President today was the \$32,900,000,000 Federal Interstate Highway Aid bill.

actor entitled to an adjustment of state excise and license imposed against him?

ANSWER: No. (Duhamel v. States, 119 Fed. Supp. 192, decided by the United States Court of Appeals. Decisions of the Court of Appeals are subject on appeal to reversal by the United States Supreme Court.

Court of Claims applied a fundamental rule of law that a contract with no ambiguous wording cannot be read as meaning something other than what the language implies unless it appears that, through a mistake, the true intention of the parties was not expressed. In the provision for adjustment of price in the event of federal price changes implied that no other tax

GIANT ROAD BILL SIGNED

\$32.9 BILLION HIGHWAY BILL GETS GREEN LIGHT FROM IKE

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victim roads. Re can't

THE ANSWER: No. (Assessors of Sheffield v. J. F. White Contracting Co., 130 N. E. 2d 696, decided by the Massachusetts Supreme Judicial Court.)

The court said that personal property should be taxed at the domicile of owner unless it has acquired a permanent situs elsewhere. In this case, the equipment's location at Sheffield was merely temporary, although for an indefinite time.

EL KNOWN



Scraper Blades

Amsco Manganese Steel gives longer lasting "bite". Amsco HF-40 is ideal for hardfacing.

HARDFACING

OTHER AMSCO PRODUCTS

DIGGING: backhoe buckets—dippers and parts—repointers—dragline bucket parts—dragline chain—sheaves—pinions.

CRUSHING: concaves—mantles—jaw plates—mill liners—hammers.

HANDLING: truck bed liners—grizzly parts—car wheels and liners—sheaves, gears, pinions.

WELDING: automatic and semi-automatic welders—hardfacing rod—manganese plates and shapes.



AMSCO

American Manganese Steel Division • Chicago Heights, Ill.
OTHER PLANTS IN: DENVER, LOS ANGELES, NEW CASTLE, DEL., OAKLAND, CAL., ST. LOUIS, JOLIETTE, QUEBEC

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1000 MILES

Washington
President
Eisenhower

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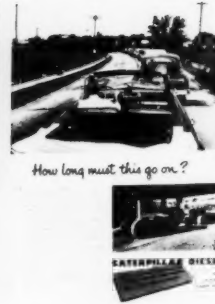
victim roads
Re
can't



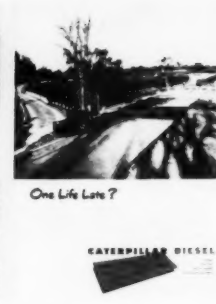
March, 1949



November, 1949



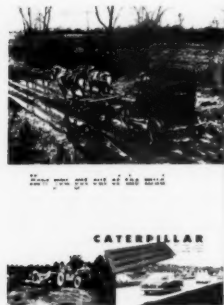
January, 1950



February, 1950



September, 1950



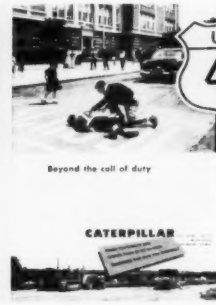
November, 1950



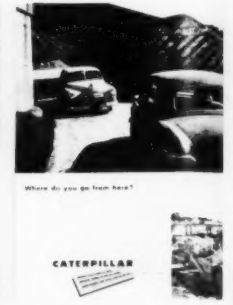
February, 1952



June, 1952



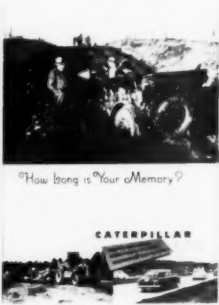
September, 1952



November, 1952



February, 1953



March, 1953



May, 1953



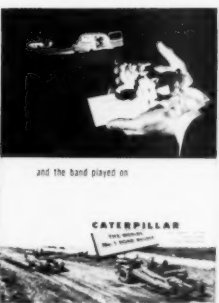
September, 1953



October, 1953



November, 1953



January, 1954



February, 1954



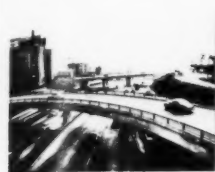
May, 1954



June, 1954

Early in 1949, Caterpillar Tractor Co. began a series of full-page 4-color advertisements in *The Saturday Evening Post* and other national magazines. These pages were designed to forcefully awaken the public to the frightful toll of lives and money taken yearly by inadequate roads.

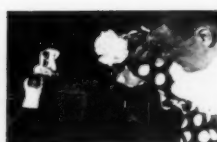
The 40 advertisements, reproduced in miniature above, give some idea of



One generation at 50 MPH. During rush hours?

CATERPILLAR

January, 1955



Does a good time have to end like this?

CATERPILLAR

February, 1955



IT'S NO FUN BEING A BOTTLENECK

CATERPILLAR

March, 1955



How safe are you driving to work?

CATERPILLAR

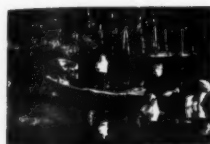
April, 1955



ALL DEATH TAKE A HOLIDAY THIS MEMORIAL WEEK END?

CATERPILLAR

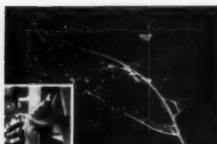
May, 1955



How to get longer vacations

CATERPILLAR

July, 1955



"But that new highway isn't helped or hindered"

CATERPILLAR

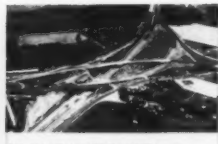
September, 1955



TRUCKS WON'T GET FOR FREE

CATERPILLAR

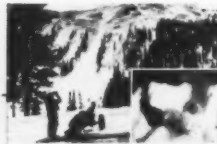
October, 1955



This road will save \$111,000 a year

CATERPILLAR

November, 1955



Building an overpass for a major express road

CATERPILLAR

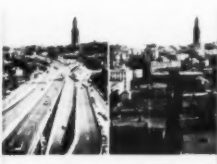
December, 1955



How to get more time for fun

CATERPILLAR

January, 1956



minutes from home... or 40?

CATERPILLAR

February, 1956



ALL THIS AND GOOD DRIVING TOO!

CATERPILLAR

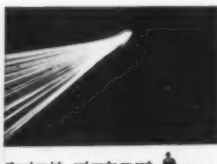
March, 1956



Illinois' pride of its big bridge has

CATERPILLAR

April, 1956



"Send my job... and maybe my neck"

CATERPILLAR

May, 1956



TONIGHT

CATERPILLAR

June, 1956



Why Am I stuck? Can drive more places - faster and safer than ever

CATERPILLAR

July, 1956



HOW TO GET THREE MORE MILES A WEEK AT HOME

CATERPILLAR

August, 1956



BLACK MOUNTAIN GOOD BUT A KILLER

CATERPILLAR

September, 1956



Look what's happened to U.S. 52 in Indiana

CATERPILLAR

October, 1956

the continuing impact carried by this campaign. In the last two years emphasis has been changed to show how various states are meeting the highway problem.

With a strong awareness of highway needs now in the public mind, the new Federal Interstate Highway Program has been enacted into law. The next two pages show a breakdown of probable highway expenditures by states.



Ala. \$730,800,000



Ariz. \$424,200,000



Ark. \$529,000,000



Cal. \$2,019,600,000

THE NEW INTERSTATE HIGHWAY SYSTEM AND PROPOSED FEDERAL AID TO STATES

These are the estimated Federal grants to states for the next 13 years, to be used for both the Interstate Highway System and other Federal-Aid roads.

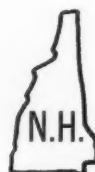
These figures represent 90% of the cost for the Interstate System, 50% for the remainder.



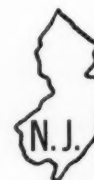
Minn. \$829,600,000



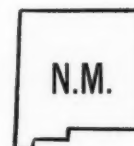
Nev. \$371,100,000



N.H. \$204,800,000



N.J. \$753,900,000



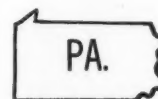
N.M. \$450,700,000



Okla. \$661,200,000



Ore. \$507,900,000



Pa. \$1,865,800,000



R.I. \$216,400,000



Utah \$351,900,000



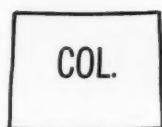
Vt. \$201,200,000



Va. \$718,400,000



Wash. \$582,000,000



Col. \$518,300,000



Conn. \$342,500,000



Del. \$202,200,000



Fla. \$608,400,000



Ga. \$838,700,000



Idaho \$364,300,000



Ill. \$1,668,500,000



Ind. \$872,100,000



Iowa \$751,300,000



Kan. \$683,300,000



Ky. \$666,900,000



La. \$588,500,000



Me. \$284,400,000



Md. \$418,700,000



Mass. \$735,700,000



Mich. \$1,277,600,000



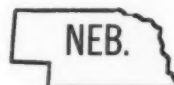
Miss. \$574,000,000



Mo. \$986,400,000



Mont. \$539,000,000



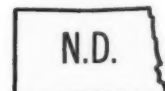
Neb. \$544,100,000



N.Y. \$2,469,500,000



N.C. \$903,500,000



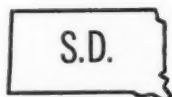
N.D. \$406,900,000



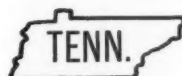
Ohio \$1,509,300,000



S.C. \$476,900,000



S.D. \$427,700,000



Tenn. \$766,800,000



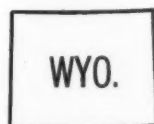
Texas \$2,112,500,000



W.Va. \$418,200,000



Wisc. \$822,600,000



Wyo. \$369,900,000



D.C. \$220,900,000

CATERPILLAR— your partner in earthmoving progress— has the equipment ready for the big job



The mighty D9, with 320 Turbocharged engine HP and No. 9S Loadshape Bulldozer, heads the line of six Caterpillar crawler Tractors. The other machines, with engine HP, are: D8—191 HP, D7—128 HP, D6—93 HP, D4—63 HP, and D2—48 HP.



The Turbocharged 300 HP DW21 with the 25 cu. yd. (heaped) capacity No. 470 LOWBOWL Scraper provides a fast, highly maneuverable earthmoving unit.



The No. 977 Traxcavator of 2½ cu. yd. bucket capacity is the largest of the three Cat-built tractor-shovels. The No. 955 has a 1½ cu. yd. bucket; the No. 933, a 1 cu. yd. bucket. Lift forks and other attachments give added versatility to these highly productive units.



The No. 8 Ripper, for use with the D8 Tractor, is one of a line of five Cat-built tractor-mounted rippers. In addition to the No. 8, they are: the No. 9, the No. 6, the No. 4 and the No. 2 for use with other Caterpillar-built Tractors and Traxcavators.



The four-wheel DW20, with Turbocharged 300 HP Cat Engine, teams up with the LOWBOWL No. 456 Scraper (25 cu. yd. capacity) for high-speed earthmoving on longer hauls. The four-wheel 186 HP DW15 works with the No. 15 Scraper (12½ cu. yd. capacity).



Representative of the Cat four-wheel, crawler-drawn Scraper line is the No. 463. Heaped capacities are: No. 90, 27 cu. yd.; No. 463, 25 cu. yd.; No. 70, 15 cu. yd.; No. 60, 9 cu. yd.; and No. 40, 4.5 cu. yd.



Caterpillar Electric Sets are available in eight basic models ranging from 30 to 350 KW. Available in portable units, they are a reliable and convenient source of electric power.



Nine basic sizes, from 65 to 650 HP, make up the line of Caterpillar Diesel Engines. They are used by over 100 manufacturers to power excavators, compressors, crushers and other construction machines.



Heading the line of three Cat Motor Graders is the 115 HP No. 12. The No. 112 has 75 HP; the No. 212 has 50 HP.

N. J. GIRDS TO PUSH ROAD CONSTRUCTION

Highways Officials and Senators Confer on Possible One-Cent Gas Tax Rise

Trenton, June 29. The ex-
tation, according to state high-
way officials here. New Jersey
a 90-10 basis for interstate
roads, and one-third on a 50-50
basis to finance primary, sec-
ondary and urban roads. Thi

41,000 Miles of Super-Highways New Federal Bill



Next year—and the years ahead—offer you the greatest challenge in the whole history of construction. The highway work alone will dwarf any previous undertaking.

Caterpillar has been preparing for this time. Plant capacity has been doubled and is still expanding. New and improved products are now in full production, giving you equipment designed and built to do more work, faster, at lower cost. When you bid on a contract, that kind of equipment can make the difference between profit and loss.

Caterpillar leadership is leadership in action. It

never stands still. The full resources of Caterpillar research, both in the laboratory and right in the field with you, are constantly devoted to the development of even more efficient engines and earthmovers—equipment that keeps pace with your increasing opportunities.

Caterpillar Tractor Co., Peoria, Illinois, U. S. A.

CATERPILLAR

*Caterpillar, Cat and Traxcavator are Registered Trademarks of Caterpillar Tractor Co.

YOUR PARTNER IN EARTHMOVING PROGRESS

STATE TO GET \$230 MILLION IN FEDERAL FUNDS BY 1959

Illinois Total Over \$1½ Billion for 13-Year Highway Building Era

Washington, D. C., July 3. Estimates released by the U. S. Bureau of Public Roads call for \$229,700,000 of Federal funds to be spent in

Illinois in three years, starting July 1, 1956.

This represents 90 per cent of Interstate road construction costs. The state will furnish the additional 10 per cent. For the full 13-year period covered by the Federal Highway bill it is estimated Illinois will receive nearly \$1,700,000,000.

HIGHWAY BILL BOON TO UTAH ROAD SYSTEM

Salt Lake City, July 3—Over-all spending in Utah for highways in the next three years will rise from \$25.2 million to \$88.6 million. And for the succeeding 10-year period it will continue in the \$75 to \$95 million bracket.

This will result from the new 13-year road building program signed into law by President Eisenhower. By 1970 Utah will be criss-crossed by splendid four and six lane divided highways.

The state now has some 700 miles of interstate highways and the bill provides for a rebuilding of an amount equal to this mileage.

41,000 MILES OF HIGHWAYS APPROVED BY PRESIDENT

Washington, D. C., June 29—You're going to get 41,000 miles of new four, six and eight lane highways in the next 13 years.

It became official today when President Eisenhower signed the Federal Interstate Highway bill. Under the new law, the Federal government will spend \$32,900,000,000 through 1969 for the new roads.

The bill calls for a vast network of free super highways linking most major cities and state capitals.

\$32.9 Billion Highway Bill a Bargain for Car Owner

New Taxes on Gas, Tires to Cost Average Driver Only \$8.60 per Year

Washington, D. C., July 2. The Federal Highway Aid bill, which has been high on the President's list of must legislation, is now law. As highway authorities have pointed

It is a pay-as-you-go program. But the \$33 billion total, to be paid for by a 1-cent increase in the gasoline tax, a 2 per cent rise in the price of tires, a pound for tires and trucks, buses and trailers, will result in safer, more economical driving. The average car owner will pay only \$8.60 a year, and should save more than that in fuel, tires,

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DECEME

very substantial quantities must be shipped into the state in interstate commerce for use on the job furnished added reason for giving the National Labor Relations Board exclusive jurisdiction over the dispute.

Contractor is independent under cost-plus contract

THE PROBLEM: Under a cost-plus prime contract, the contractor secured labor and materials for the job. Could the owners of land on which a building was erected be held liable to the prime contractor's subcontractors and laborers, on the theory that the contractor was an agent of the owner and did not act independently?

THE ANSWER: No. (Henderson v. Couch, 274 S. W. 2d 844, decided by the Texas Court of Civil Appeals, Eastland.)

The court drew a distinction between cases like this one, where the contract specifically required the contractor to furnish labor and materials, and an earlier Texas case where the contract specified that the owner would pay for them. (Gilbert Mfg. Co. v. Connellee, 265 S. W. 375.)

Misuse of bulldozer is considered theft

THE PROBLEM: A contractor left a bulldozer, from which he had drained the water, at the edge of a field. A nearby resident, using the unit for 30 or 40 minutes without authorization, overheated it. Was the resulting damage covered by the contractor's insurance against loss or damage to the bulldozer by theft?

THE ANSWER: Yes. (National Fire Insurance Co. v. Slayden, 85 So. 2d 916, decided by the Mississippi Supreme Court.)

The court cited decisions of the courts of Tennessee, Ohio, and Kansas to the effect that when a machine or vehicle is insured against theft, without special definition of the term "theft", and some unauthorized person unlawfully takes possession for use as long as he sees fit, the resulting damage is covered by the policy.

Transient-equipment taxes

THE PROBLEM: In Massachusetts, as in some other states, the "situs" (location) of chattel property on January 1 fixes the place where it is taxable. Normally, a contracting company kept its heavy-construction equipment at Cambridge, Mass., but some of it was on a job at Sheffield on January 1, 1953. The machinery had been there for nine months but it was removed shortly after the first of the year. Was the equipment subject to taxation at Sheffield?

THE ANSWER: No. (Assessors of Sheffield v. J. F. White Contracting Co., 130 N. E. 2d 696, decided by the Massachusetts Supreme Judicial Court.)

The court said that personal property should be taxed at the domicile of owner unless it has acquired a permanent situs elsewhere. In this case, the equipment's location at Sheffield was merely temporary, although for an indefinite time.

Right to final payment conditioned by contract

THE PROBLEM: An excavating and grading contract was on a printed form, but a typed rider was attached. The rider required the subcontractor to deliver to the contractor a general release protecting him and the owner against all claims arising out of or connected with the contract. This had to be done before the subcontractor received final payment. Did the clause control any inconsistent printed clauses in the contract?

THE ANSWER: Yes. (R. J. Marshall, Inc., v. Turner Construction Co., 139 N. Y. Supp. 2d 55, decided by the New York Supreme Court, Dutchess County.)

The court said that under the typed

clause the contractor was entitled to a release worded as to protect both owner and contractor against further claims by the subcontractor as well as by third parties. Decisions by the United States Supreme Court and the New York Court of Appeals were cited in support of the point that a contract for final payment by an owner or general contractor may be conditioned upon release of such a claim.

Tax clause in contract

THE PROBLEM: A contract to construct water-treatment facilities at an Army camp provided that the contract price should be readjusted should there be any change in federal taxes imposed upon the contractor in connection with the project. Was the

contractor entitled to an adjustment because of state excise and license taxes imposed against him?

THE ANSWER: No. (Duhamel v. United States, 119 Fed. Supp. 192, decided by the United States Court of Claims.) Decisions of the Court of Claims are subject on appeal to possible reversal by the United States Supreme Court.

The Court of Claims applied a fundamental rule of law that a contract having no ambiguous wording cannot be read as meaning something broader than what the language implies, unless it appears that, through mutual mistake, the true intention of the parties was not expressed. In short, the provision for adjustment of the price in the event of federal-tax changes implied that no other tax

At these TOUGH WEAR points, specify

"THE TOUGHEST STEEL KNOWN"*

Sprockets

Amsco® Manganese Steel sprockets and replaceable rims, hardfaced with Amsco "Economy Hardface C", give 3 to 4 times the life of ordinary sprockets.

Rollers, Idlers

Automatic build-up, then hardfacing with Amsco AW-79 Rod, gives twice the wear of original parts, saves 50% on replacement.

Track Shoes

Manganese Steel construction, with grouser bar integrally cast, and holes counter-sunk so bolts can be re-used. For temporary repair, grouser bar is torch cut and welded to shoe.

End Bits

Corner inserts of Amsco Manganese Steel add extra service life to blade. Amsco HF-40 hardfacing further increases wear resistance.

Scraper Blades

Amsco Manganese Steel gives longer lasting "bite". Amsco HF-40 is ideal for hardfacing.

*AMSCO MANGANESE STEEL . . . plus AMSCO HARDFACING

Shown above are just a few of the "tough wear" points where Amsco products can save you money. Whether for original parts, or for build-up and hardfacing, specify Amsco Manganese Steel and Amsco Hardfacing for maximum operating economy.

We'll be glad to give you full information on Amsco Tractor Parts, Hardfacing Materials or Automatic Welding Machines. Just call your nearby Amsco representative, or write us direct.

OTHER AMSCO PRODUCTS

DIGGING: backhoe buckets—dippers and parts—repointers—dragline bucket parts—dragline chain—sheaves—pinions.

CRUSHING: concaves—mantles—jaw plates—mill liners—hammers.

HANDLING: truck bed liners—grizzly parts—car wheels and liners—sheaves, gears, pinions.

WELDING: automatic and semi-automatic welders—hardfacing rod—manganese plates and shapes.



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OTHER PLANTS IN: DENVER, LOS ANGELES, NEW CASTLE, DEL., OAKLAND, CAL., ST. LOUIS, JOLIETTE, QUEBEC

For more facts, use Reader-Reply Card opposite page 18 and circle No. 254

avoid legal pitfalls

changes would call for readjustment. It was immaterial that the contractor thought the contract covered state taxes. (It would seem, under a general rule of law, that had the government fraudulently omitted from the contract a mutually intended clause that would have covered state taxes, the contractor would have been entitled to a price readjustment.

Subcontractor was liable for injury by a hoist

THE PROBLEM: A contractor furnished a hoist for subcontractors to use in moving materials. To protect the contractor against liability for injury to anyone using the hoist, it was agreed that the subcontractor would satisfy himself as to the safety of the unit. While lifting a Georgia buggy loaded with concrete, the hoist fell, injuring one of the subcontractor's employees. The injured man's suit for damages against the contractor was compromised. Could the contractor require the subcontractor to reimburse him for the damages paid, even if the hoist fell because of the contractor's negligence?

THE ANSWER: Yes. (James Stewart & Co. v. Mobley, 282 S. W. 2d 290, decided by the Texas Court of Civil Appeals, Dallas.)

State courts are of varying opinion on the validity of an agreement by one party to indemnify another against liability for an injury caused by the second party's negligence. But the court noted that most other state courts are in accordance with the decisions of the Texas courts to the effect that an agreement for indemnity may cover injuries caused by the combined negligence of both parties or through the sole negligence of the party to be indemnified.

Progress-payment method did not bar damage claim

THE PROBLEM: A contractor who has completed his work and turned it over to the owner ordinarily is not held liable to an outsider who is damaged through defective performance of the job. A contractor constructed a levee for a state highway commission and received a monthly progress payment, less a retained 10 per cent, to cover any correctional work needed after a section of the levee had been constructed. Built along a highway to protect adjacent farmland, the levee permitted water to break through, causing damage to the crops. Was the contractor liable?

THE ANSWER: Yes. (Ortego v. Caldwell, 87 So. 2d 124, decided by the Louisiana Supreme Court.)

The decision was influenced by the facts that the entire contract work was not accepted until after the damage had been done and that, pursuant to the agreement under which the abutting owners granted right-of-way for the levee, it had been required that the levee be constructed to their satisfaction.

Insurance covers cost of removing truck from pit

THE PROBLEM: The rear end of a backed up concrete mixer sank into an excavation so that the rear wheels were buried. The front wheels were in the air a foot or so above the ground level. Could the owner collect on a motor-vehicle accident policy which did not have collision or "upset" coverage?

THE ANSWER: (City Coal & Supply Co., 133 N. E. 2d 415, decided by the Ohio Court of Appeals, Mahoning County.)

The court said that the truck had not been upset and that the contractor could collect the cost of its damage. In addition, another clause permitted the collection of the cost of

removing the truck from the pit before concrete-setting caused further damage.

Fill sliding from slope damages homes below

THE PROBLEM: In a suit arising out of a job of leveling home sites on a tract at the top of a canyon, the plaintiff claimed that the defendants pushed excavated material onto the slope below. The natural slope was so stable that it had resisted erosion that would have damaged property at the bottom of the canyon. However, heavy rainfall caused the fill to fall on the plaintiff's property below. Did the defendants' liability depend on whether they had exercised reasonable care to prevent a slide?

THE ANSWER: Yes. (Beck v. Bel Air Properties, 286 Pac. 2d 503, decided by the California District Court of Appeals, Second District.)

Even though a jury had awarded damages in favor of the plaintiff, the Court of Appeals ordered a new trial because the trial judge had instructed the jury that the defendants were absolutely liable for damages done by escaping fill. The higher court said that liability depended on whether the defendants had negligently failed to use a proper method of securing the fill.

The court also said that it was common knowledge to Southern Californians that retaining walls, hillside terracing, planting, and similar methods have been used successfully to hold fills in place.



ALL NEW DESIGN! Simple... Foolproof... Low Cost 1500 WATT HOMELITE GENERATOR

Model 35A115
Homelite Generator
1500 Watts, 115 Volt
60 Cycle AC

WEIGHS ONLY 90 LBS.

As easy to move as an electric hand saw!

- 1. New Money-Saving features**... No DC brushes; just two easy-to-get-at collector ring brushes... No commutator or DC windings... No intermediate couplings; armature keys directly to shaft. Fewer parts to wear out — longer trouble-free generator service.
- 2. Constant Voltage**... less than 4% change from no load to full 1500 watt capacity... assures long service life for your electric tools... guarantees top performance at all times.
- 3. Overload Capacity**... 1500 watt continuous duty with generous overload capacity prevents tool stalling under heavy loads... insures uninterrupted service even when starting loads exceed operating loads.
- 4. Compact and Lightweight**... one man can easily carry this generator wherever you need electricity to power time-saving elec-

tric tools. No need for long, hazardous power-consuming cables.

Whatever tools you want to operate — electric saws, drills, floodlights, grinders, belt sanders, hammers, — the new Homelite 35A115 generator can save you money. For a free demonstration or additional information, call your nearest Homelite representative, or write:

SAVE EVEN MORE! New Homelite electronic idle control unit, available as optional accessory, runs engine at idle speed when no current is drawn... automatically brings engine to full speed when load is

applied.

Ask your Homelite representative to show you how this easily-installed accessory reduces engine wear... increases service life... cuts fuel consumption.

HOMELITE

A DIVISION OF TEXTRON, INC.

5912 RIVERDALE AVE., PORT CHESTER, N. Y.

Manufacturers of Carryable PUMPS • GENERATORS • BLOWERS • CHAIN SAWS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 255

CONTRACTORS AND ENGINEERS

With the use of the Bantam gooseneck crane attachment, the Bantam CR-35 has a minimum working clearance height of 10½ feet.

Gooseneck boom designed for low overhead work

■ A 15-foot gooseneck crane attachment, designed for the self-propelled Bantam Model CR-35 crane, is announced by the Schield Bantam Co. The new attachment features a minimum working clearance height of 10½ feet. The working radius at this height is 17½ feet, and the travel-with-load crane capacity is listed at 4,675 pounds.

The gooseneck attachment is a specially constructed 15-foot box boom



with the center line of the top section offset 25 degrees with respect to the bottom section. The offset is accomplished through the insertion of a wedge with an angle of 25 degrees. The wedge is held in place by 24 heat-treated capscrews and is removed to convert the attachment to straight boom operation.

The bottom section is nearly 9 feet long, pin to frame, and the top section is approximately 7 feet long, frame to sheave. The distance between the boom foot pin and the center line of the boom tip sheave is just over 15 feet. The angled boom has a maximum lifting capacity of 6 tons.

For further information write to Schield Bantam Co., Waverly, Iowa, or use the Request Card at page 18. Circle No. 36.

New painting service for construction rigs

■ A new paint service for construction equipment is available from Body Bros., Inc. The company has established a special division to study specific problems relative to equipment finishing. Upon request its field engineers will check conditions under which equipment operates to establish the necessity for various special paints.

The engineers check the need for rustproofing; resistance to acids, alkalis, industrial fumes, and salt air; high night visibility; and abrasive resistance. The findings are analyzed in the Body Bros. laboratory and definite recommendations are made.

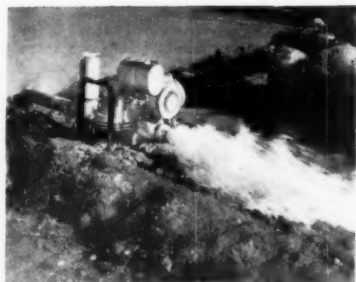
For further information write to Body Bros., Inc., Bedford, Ohio, or use the Request Card at page 18. Circle No. 100.

Hand winches described

■ The hand winches manufactured by Beebe Bros., are described in a folder available from the company. The winches are available in 14 models to cover straight-line capacities of from 250 pounds to 5 tons. The largest, Model H-24, is one of four with a 5-ton capacity and 24:1 and 4:1 gear ratios. It has a drum capacity of 1,335 feet of ¾-inch cable and 335 feet of ¼-inch cable. It is recommended for use in bridge and dam construction.

To obtain Form 48 write to Beebe Bros., 2724 Sixth Ave. S., Seattle 4, Wash., or use the Request Card at page 18. Circle No. 67.

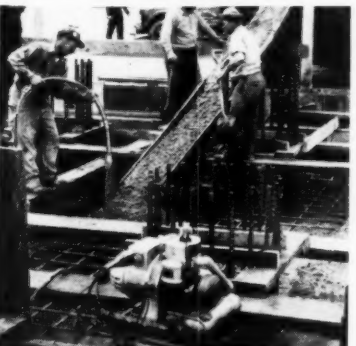
Full Line of Carryable Construction Equipment Now Offered by Homelite



Carryable Diaphragm Pump . . . This self-priming, 120 pound diaphragm pump will handle water in the thickest sand, muck, or mud. Capacity: 5,000 g.p.h. Size: 3". Complete line of centrifugal pumps are also available in sizes from 1½" to 3".



Chain Saws For Every Job . . . Now you can choose from a full line of lightweight, powerful Homelite chain saws. From 3½ to 7 horsepower . . . 19 to 29 pounds. Brush cutting and clearing attachments are available to handle all your cutting jobs.



One-Man Electric Vibrator . . . It takes only one man to place concrete with powerful, Homelite high-cycle or universal electric concrete vibrators. Carryable Homelite generator provides power for high-cycle vibrators and 110 volt DC for all universal vibrators, tools and floodlights.

HOMELITE

a division of Tectron Inc.
PORT CHESTER, NEW YORK
For more facts, circle No. 256

Wire-rope assemblies

■ Wire-rope assemblies, consisting of preformed wire rope with a Safe-Lock permanently swaged terminal attached to one or both ends, are featured in a catalog from the Macwhyte Co. Terminals described in the catalog include the pin eye, standard fork, small and large ring eye, oval eye, standard and threaded sleeve, and threaded stud. Data is also given on the standard and safety hook, and the swaged clevis and eye. Each terminal is diagrammed, briefly described, pictured, and accompanied by specifications.

To obtain Catalog 5601 write to the Macwhyte Co., 2940 14th Ave., Kenosha, Wis., or use the Request Card at page 18. Circle No. 48.

Faster **BETTER**
CURB AND GUTTER
LAYING

at
MUCH
LESS
COST

Save **TIME, MONEY**
AND LABOR WITH
THIS NEW METHOD

NO HAND FINISHING
NO FORMS

Operating on an entirely new principle by laying curbing and gutter by the extrusion method without forms or hand finishing, the Smith-Field Automatic Curb and Gutter Machine and the Stephens-Canfield Automatic Curbers offer a substantial savings in time, money and labor to the user.

Working equally well with either Asphaltic or Portland Cement concrete, the Smith-Field Automatic Curb and Gutter machine will lay up to 1,000 ft. of integral curb and gutter per day, under efficient methods and the Stephens-Canfield Automatic Curbers, up to 2,500 ft. per day.

Write for full details and prices

E. L. HARDIN ASSOCIATES, INC.

SALISBURY, NORTH CAROLINA U.S.A.

SOLE MANUFACTURERS AND DISTRIBUTORS—U.S.A. AND FOREIGN
PATENT NO. 2,707,422—AND OTHER PATENTS PENDING

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SMITH-FIELD
AUTOMATIC CURB
AND GUTTER
MACHINE
MODEL MARK 3



STEPHENS-CANFIELD
AUTOMATIC CURBER
MODEL 55A

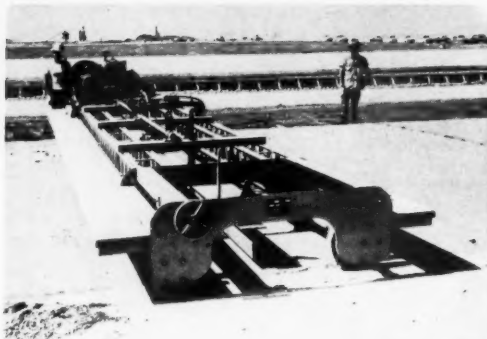


STEPHENS-CANFIELD
AUTOMATIC OFFSET CURBER
MODEL 56-W

Prepares fresh concrete for easy joint sawing

■ A machine that follows the longitudinal finishing rig in a paving train and weakens the fresh concrete so that construction joints can be sawed easily with fibre abrasive blades is available from the Seaman-Andwall Corp. The company has purchased the engineering, manufacturing, and distributing rights to the machine from Vibro-Joint Co., Inc.

The self-contained Vibro-Joint cutter rides either the forms or the adjacent slabs. Braked into position where the joints are to be made, its long cutter bar is lowered hydraulically into the fresh concrete and vibrated until it reaches the desired depth. This creates a weakened plane



Following the longitudinal finishing machine in the paving train, the Vibro-Joint cutter weakens the fresh concrete so that construction joints can be easily sawed with fibre abrasive blades.

by displacing the aggregate in the concrete, leaving only sand and cement in the joint area.

The Vibro-Joint cutter is available in two sizes, one for paving lanes between 18 and 25 feet wide and the

other for lanes 10 to 13 feet wide. According to the company, the use of the machine allows actual sawing to be started quicker, reduces the necessary depth of the saw cut, and permits the sawing of more than 3,000

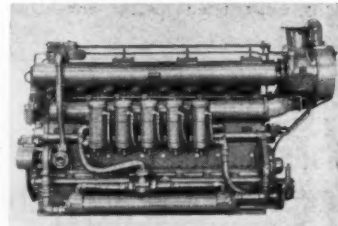
feet of joints per day.

For further information write to the Seaman-Andwall Corp., Milwaukee, Wis., or use the Request Card at page 18. Circle No. 65.

Series of diesel engines operates on low-cost fuel

■ An improved series of diesel engines which can operate on low-cost fuel has been developed in ratings up to 1,025 horsepower by the White Diesel Engine Division of the White Motor Co. The Model 40 diesels are available naturally aspirated or supercharged.

The engines are recommended for use in power shovels, as a standby electrical source in conjunction with



This new White Model 40 diesel delivers 1,025 horsepower yet is the same size as the company's 700-hp diesel of the previous series.

a generator, and for other heavy-duty applications. Portable engine-generator sets have capacities of up to 600 kw.

The engines are 4-cycle, 6 or 8-cylinder, vertical, in-line units. Outputs range upwards from 215 horsepower. The 1,025-hp rig represents nearly a 50 per cent increase in capacity over the manufacturer's previous 700-hp rig, yet is the same size as the old model.

For further information write to the White Diesel Engine Division, White Motor Co., Springfield, Ohio, or use the Request Card at page 18. Circle No. 38.

Clevis grab hook fits most tractor drawbars

■ A clevis grab hook that is said to attach directly to all tractor drawbars, front or rear, up to 1 1/4 inches in diameter, is available from Midland Industries, Inc. It can be used with any chain up to 7/16 inches in diameter, including Hi-Test chain.

The extra-long hook can grab two 5/16-inch or smaller chains at the same time, the manufacturer reports. It is forged of steel and has a special heat-treated 3/4-inch steel pin. It is 7 inches long and fits easily into any tool box.

For further information write to Midland Industries, Inc., 910 Second Ave. S. W., Cedar Rapids, Iowa, or use the Request Card at page 18. Circle No. 62.

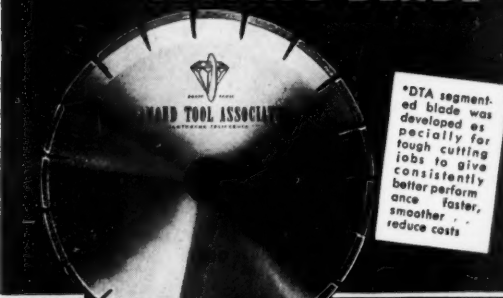
H. K. Porter elects

Sam Gurley, Jr. has been elected vice president of sales for the H. K. Porter Co., Inc., New York, N. Y. Until recently, Gurley held a similar position with the Reichhold Chemicals, Inc. He is a member of the Chemical Society, the Tool Engineers Society, and the Plastics Society.

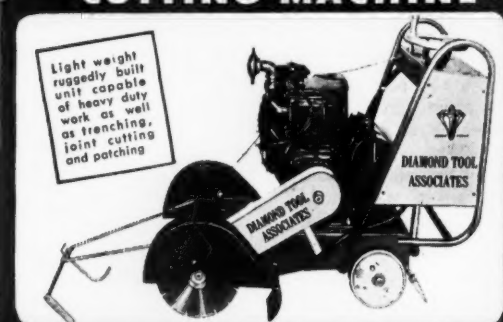
To do this CUTTING JOB BETTER-



You need this CUTTING BLADE-



And this CUTTING MACHINE-



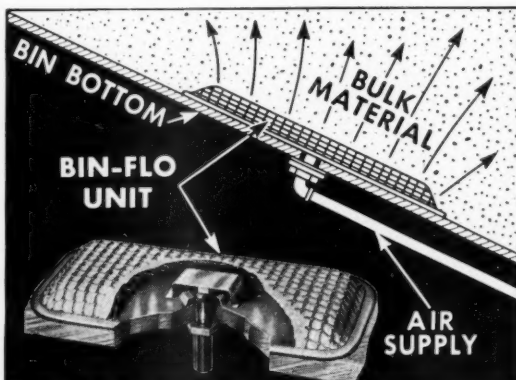
and of course **DTA***

- 6 BIG REASONS WHY *DTA IS YOUR BEST BUY**
1. Outstanding research and development.
 2. Precise control of manufacturing process.
 3. Highest quality diamond BOART.
 4. The best in metal bondings.
 5. Top quality steel centers.
 6. Complete sales and field service by experienced personnel selected for their knowledge of your cutting problems.

***DIAMOND TOOL ASSOCIATES**

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BIN-FLO USES SMALL VOLUME OF AIR AT LOW PRESSURE KEEPS BULK MATERIALS MOVING

BIN-FLO units in bins, chutes, hoppers, etc., restore flow characteristics to dry, finely ground materials which tend to pack or bridge in storage. Types for all materials and conditions. No moving parts; simple installation; negligible operating cost; no maintenance cost.

BIN-DICATOR bin level indicator—"The Eyes of the Bin"—automatically reports levels of materials in storage; automatically controls filling machines; prevents waste.

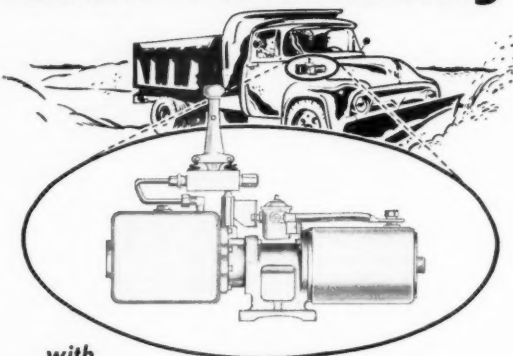
THE BIN-DICATOR CO.

13946-M Kercheval • Detroit 15, Mich.

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Fast-Automatic Snow Plow Lifting



with

MONARCH DYNA-MIGHT POWER HYDRAULIC CONTROLS

Fan Belt or Electric models available for practically all makes of trucks. See your dealer or write for full details.

MONARCH

ROAD MACHINERY COMPANY

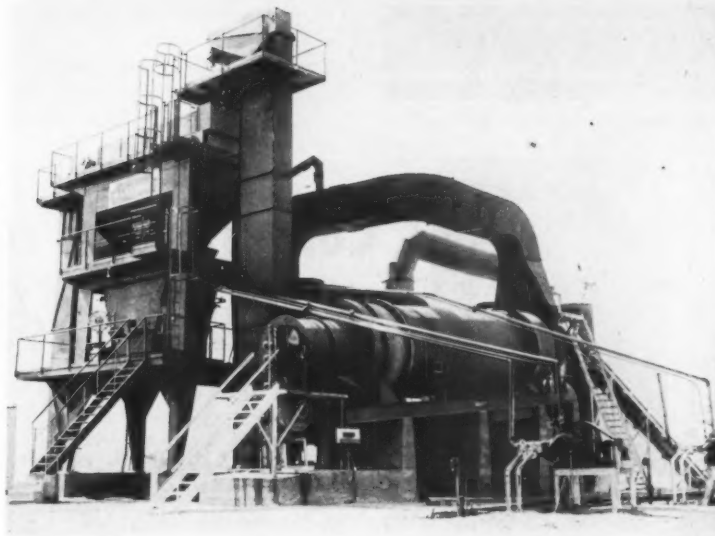
1331 Michigan St., N.E.

Grand Rapids 3, Michigan



For more facts, circle No. 260

THIS 6,000-POUND-CAPACITY ASPHALT PLANT is the largest in the new line of semi-portable plants announced by the Standard Steel Corp. The new line is known as the Road-Master series and is built in capacities ranging from 4,000 to 6,000 pounds. This unit, the Model R-M, has an 8-foot-diameter dryer and reportedly can turn out in excess of 240 tons per hour. The Road-Master plants feature oversized screens, dryers, and elevators; dust seals on all units; and simplified push-button controls to reduce operator fatigue, according to the manufacturer. For more information on the new line write to the **Standard Steel Corp.**, 5001 S. Boyle Ave., Los Angeles 58, Calif., or use the Request Card at page 18. Circle No. 72.



Truck-mounted rotary drills to 1,500 feet

■ A new truck-mounted rotary drill that has a capacity of 1,500 feet with an N-rod up to 5½ inches in diameter is announced by the Reich Bros. Mfg. Co. Unmounted, the rig weighs 8,000 pounds.

The Reich rotary has a 12-foot continuous stroke and a down pressure of 10,000 pounds. Its hoist has a capacity of 12,500 pounds. The water tank holds 275 gallons, and the water pump delivers 35 gpm at 375 psi. The torque is rated at 15,000 inch-pounds.

Optional equipment includes a variable rotation speed control, a 65-gpm water pump, hydraulic leveling jacks, and 105-cfm air circulation at 100 psi.

For further information write to the Reich Bros. Mfg. Co., 1439 Ash St., Terre Haute, Ind., or use the Request Card at page 18. Circle No. 98.

Pipe insulation tape

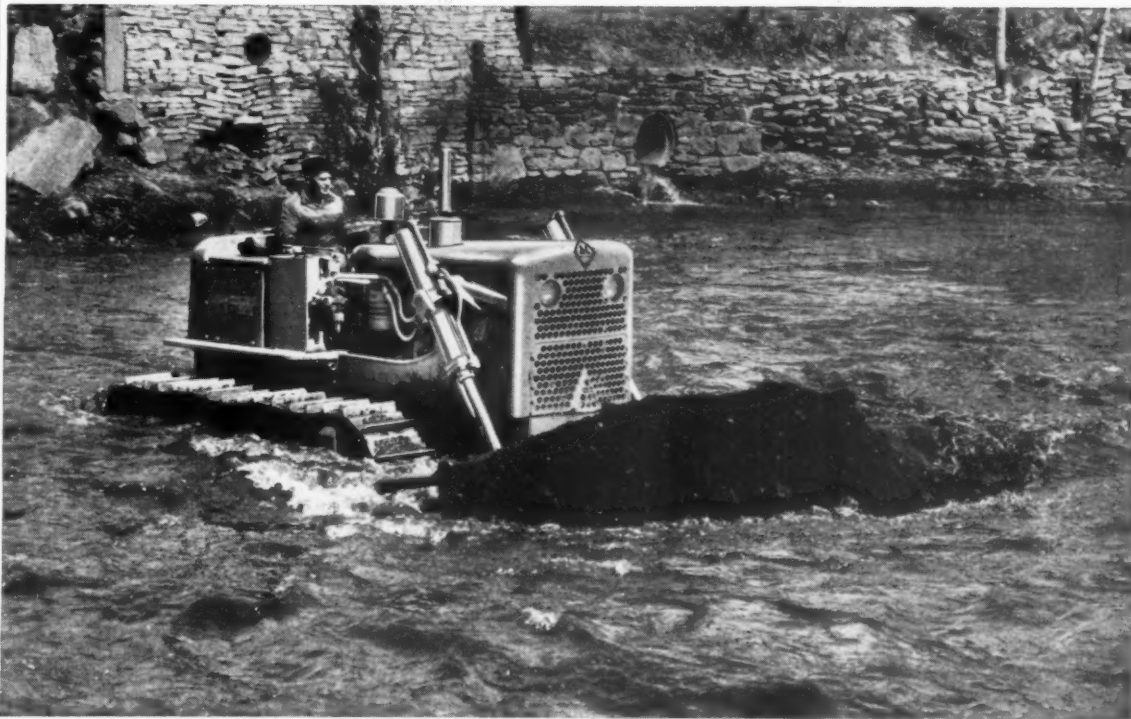
■ Techniques for protecting underground pipe from corrosion with Scotchrap insulation tape are compiled in a booklet from the Minnesota Mining & Mfg. Co. The booklet contains step-by-step photos and instructions for wrapping bends, elbows, and short sections; patching pipe with tape; preparing joint surfaces for wrapping; protecting welded joints; and taping straight pipe sections. A pipe coverage table completes the booklet.

To obtain the booklet write to the Minnesota Mining & Mfg. Co., Dept. D6-262, 900 Fauquier St., St. Paul, Minn., or use the Request Card at page 18. Circle No. 49.

Sieves, screens

■ Sieves that conform to the specifications of the ASTM and the National Bureau of Standards are detailed in a bulletin from Soiltest, Inc. Sieve shakers in various models are pictured, along with brief descriptions and specifications. Construction details and approximate dimensions are given on mechanical testing screens.

To obtain the bulletin write to Soiltest, Inc., 4711 W. North Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 25.



HD-11B 94 belt hp • 24,800 lb (approx.) as shown

Restoring river bed after heavy flood requires track-deep operation in water and silt

Positive Seals in Allis-Chalmers HD-11B tractor effectively keep out damaging dirt and water

Considerable work was required in Scranton, Pa., recently to restore the Lackawanna River bed and banks after a disastrous flood had caused waters to rise 15 to 20 feet above normal. Channels had to be cleared, creeks widened, dikes built on river banks and, in some places, the river even had to be changed back to its original course.

Restoration work was carried on by Sweeney Brothers, Scranton contractors, under the direction of the Pennsylvania Department of Forests and Waters. Key machine on one phase of the project, an Allis-Chalmers HD-11 tractor-bulldozer, often worked track-deep in water and silt while clearing

channels of mud and wreckage. The dozer also maintained roads for the fleet of seven trucks hauling material from the river.

The HD-11B proved to be an ideal machine for this job, according to Thomas J. Collins, Sweeney Brothers president. "This is our first piece of Allis-Chalmers equipment and I'm happy with it. The unit has been subjected to very tough conditions and has stood up well. Considerable saving has been made because Allis-Chalmers 1,000-hour lubrication seals keep dirt and water out of truck wheels, rollers and idlers."

The spring-loaded *Positive Seals* that permit 1,000-hour lubrication on truck wheels, idlers and support rollers are only one of the many outstanding features of Allis-Chalmers tractors.

ALLIS-CHALMERS, CONSTRUCTION MACHINERY DIVISION
MILWAUKEE 1, WISCONSIN

ALLIS-CHALMERS

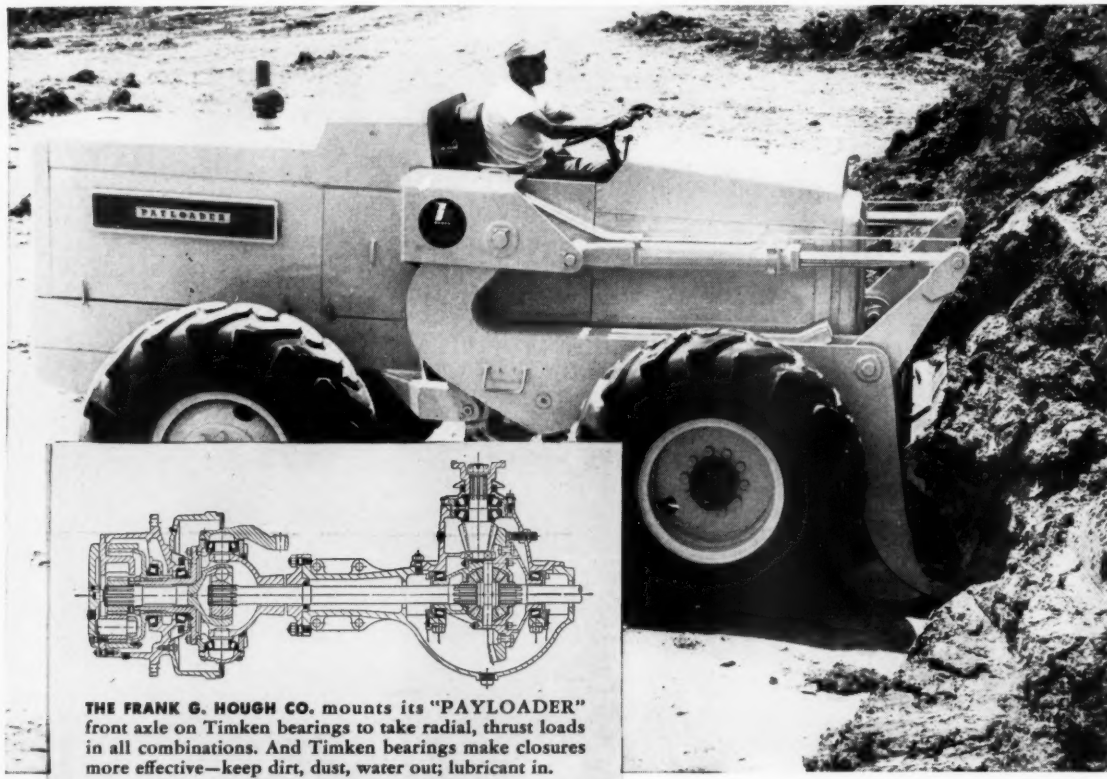


For more facts, use Reader-Reply Card opposite page 18 and circle No. 261



Construction contract provisions for liability, damage, fire insurance

by MAX R. SCHRAYE, vice president, Associated Agencies, Inc., Chicago, Ill.



THE FRANK G. HOUGH CO. mounts its "PAYLOADER" front axle on Timken bearings to take radial, thrust loads in all combinations. And Timken bearings make closures more effective—keep dirt, dust, water out; lubricant in.

TIMKEN® bearings help give 21,000 lbs. of push—up to 50% more output

IN a powerful, highly maneuverable "bulk material handler" like this "PAYLOADER", manufactured by The Frank G. Hough Co., it's not pull that counts—but *push*! Timken® tapered roller bearings in transmission, front and rear drive axles, and wheels, help this dynamic unit exert up to 21,000 lbs. of sheer shove every time it tackles a pile of sand, gravel, cement, etc.


Axles are built by Wisconsin Axle Division of Rockwell Spring and Axle Company, with Timken bearings carrying the load in both differential and final drive. But aside from its tremendous power—the "PAYLOADER" does up to 50% more work than its predecessors.

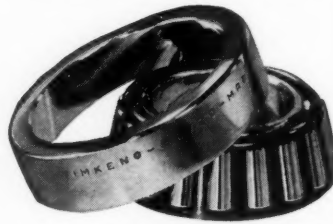
Timken bearings, because of full line contact between rollers and races, assure extra load-carrying capacity—and take heavy shock loads, because these same rollers and races are case-carburized to provide shock-resistant cores under hard, wear-resistant surfaces. The "PAYLOADER" works harder because Timken bearings work easier, under severe conditions!

Timken bearings take radial and thrust loads in any combination, because of their tapered construction. They're geometrically designed to give true rolling motion, practically eliminate friction. And they're precision-made to live up to their design. We even make our own steel,

to assure highest quality. No other American bearing maker does this.

Look for "TIMKEN" on every bearing. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ontario. Cable address: "TIMROSCO".

 This symbol on a product means its bearings are the best.



TIMKEN TAPERED ROLLER BEARINGS ROLL THE LOAD
TRADE-MARK REG. U. S. PAT. OFF.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 262

The indefinite and incomplete construction contract is the villain in 99 per cent of contractors' insurance difficulties. Because parties of a construction contract are sometimes unfamiliar with legal liability and insurance practice and terminology, these contracts frequently cause considerable trouble. For that reason it is essential for the contractor to have at his service a competent insurance broker experienced in construction work, and familiar with contractors' insurance problems. These precautions will protect the contractor from accepting a vaguely defined construction or remodeling contract.

The construction contract must define the responsibility of the owner, the general contractor, and other contractors involved. In that way all parties may be sure that each understands where his liability lies by law, and where he has agreed to assume liability which would not ordinarily be his, such as a favor to the owner, or as a patronage inducement. In this case, the contractor should at least undertake the responsibility with open eyes and a clear understanding

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Sure-Seal Tractor Roller Seals have an inner seal in addition to the regular outer seal to lock dirt and moisture out and keep grease in. High pressure lubrication can't hurt Sure-Seals—it seals them tighter from the inside without strain on the bellows. Made for Caterpillar D-4, D-6, D-7, D-8, D-9, TD-14, TD-18 and TD-24. See your tractor dealer.

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Sure-Seal Equipment Co.
1820 N.W. 25th Avenue
Portland 10, Oregon

For more facts, circle No. 263

CONTRACTORS AND ENGINEERS

This is the first of a series of articles on insurance and construction contracts by Max R. Schroyer, vice president of Associated Agencies, Inc., Chicago, Ill. Mr. Schroyer, a graduate mechanical engineer from the University of Michigan, is a Chartered Property and Casualty Underwriter, and is an officer of the Chicago Board of Underwriters. The object of this series is to help the contractor and owner draw up a clear and well defined construction contract involving insurance.

of what he has accepted.

Whenever the contractor agrees to purchase insurance to protect the owner or some other party, the language of the contract should be checked by a qualified insurance man. This will avoid the use of terminology foreign to insurance companies. Many misunderstandings have resulted when the construction contract uses terms which mean one thing in the building business and quite another in the insurance business. For example, in the commonly used phrase "liability for loss due to fire or other casualty", the term "other casualty" is much too broad to cover all contingencies in construction work.

Contractor's and owner's responsibility

A definite time should be established when the responsibility for a project is to be transferred from the builder to the ultimate owner. It should be spelled out so that all parties to the contract know when the owner accepts the completed or partially completed property he is purchasing, and whether the owner accepts each subcontract individually

or accepts all contracts together as a final finished project. Whichever alternative is agreed upon, it is important from the contractor's point of view to make the time clear.

In the construction contract, the contractor should point out to the owner that he does not assume the owner's responsibility for any accidents on vacant land not being used in the construction of the project. The owner should protect himself by obtaining an owner's protective insurance policy which will indemnify him in the event of an accident for which he is held liable by law. This relieves the contractor of the need for protecting both himself and the owner.

The owner is usually required to provide standard fire insurance for

the benefit of all parties concerned, including any mortgagor, contractor, or supplier, but excluding the contractor's equipment.

The contractor, on his part, must accept all other responsibilities for the work under his control and for any accident losses. He is accountable for injury to any of his employees during working hours and must carry insurance which completely covers his liability under the state Workmen's Compensation law. He must submit to the owner a certificate proving this.

The contractor is also responsible, during construction, for injury to members of the public and must carry proper liability insurance in adequate limits and again submit a certificate of proof to the owner. It is important



road or quarry...

GOOD COMMUNITY RELATIONS



... because of "good-will" methods and techniques in blasting

Modern blasting presents many problems to the roadbuilder and quarry operator. In addition to doing the job efficiently, he must take the utmost care and consideration to avoid disrupting the business and family life of the community.

To help you increase your standing as a good neighbor and build your professional prestige in the communities where you operate, American Cyan-

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American Cyanamid's trained engineers will be glad to assist you in the selection and most efficient use of our

high-grade blasting materials. Their skilled advice and knowledge of all types of blasting are among the many services Cyanamid provides for its customers.

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management

that this public liability insurance covers injury resulting from "occurrences" rather than only "accidents", and that the exclusions do not eliminate essential coverage.

A liability policy should be extended to include, in adequate amounts, protection against damage to other people's property. If the policy excludes damage to property under the care, custody, or control of the contractor, he must submit a completion bond to protect the owner from loss for which he is responsible but may not have the means to pay.

Loss of any property by burglary, theft, or robbery must be accepted by

the contractor until the entire project is completed and delivered to the owner for occupancy. The contractor has the responsibility of employing watchmen, if needed to obtain proper insurance, or he must guarantee to replace anything lost.

Boiler explosion insurance must be obtained if the contractor plans to use a boiler during construction.

Damage, losses

Damage to plate glass as well as other fragile materials used during construction is the contractor's responsibility, since it is almost impossible to insure such items at that period.

The contractor should reach an understanding with the owner as to the responsibility for losses suffered dur-

ing earthquake, flood, atomic fission, and war. As insurance for these hazards is difficult, if not impossible, to obtain, the owner should assume the risks.

A point to remember in negotiating the contract with architects and owners is that if the insurance coverage is inadequate it is the contractor who is usually forced to take the loss.

I suggest that the following contract clauses, carefully prepared by attorneys experienced in insurance work, be used.

Liabilities; insurance

Until the completion of the improvements to which this contract relates and possession thereof by the owner, the owner shall not in any manner be answerable or accountable

for any violation of the city ordinances, or for any loss or damage arising from negligence or carelessness of the contractor, or of any one in his employ, to any person(s), firm(s), corporation(s), and their property. The said contractor hereby agrees, covenants, and promises to make good to said owner any loss, damage, or expense so incurred, together with reasonable attorney's fees.

The contractor shall maintain such Workmen's Compensation insurance as will protect him from claims under the act; and such public liability insurance as will protect him from claims for damages for personal injury, including death. Property damage insurance should be adequate to protect him from claims for injury to any person, and loss or damage to property arising from negligence or carelessness or from operations of the said contractor, whether such operations under this contract be by the contractor or subcontractor, or any one directly or indirectly employed by either of them. Certificates of such insurance shall be filed with the owner and shall be subject to the owner's approval for adequacy of protection, including the limits of coverage and the financial responsibility of the insuring company.

Owner's liability insurance, which the owner, at his option, may maintain, makes him responsible for protection from any contingent liability for damages for personal injury, including death, and for damages to property which may arise from the operation under this contract.

Fire insurance

The owner shall effect and maintain fire and extended coverage insurance upon the entire structure on which the work of this contract is to be done to 100 per cent of the insurable value thereof, including items of

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FROM Maine to the Gulf... from the Atlantic to Iowa... you can be sure of fast, dependable service on asphalt emulsions and mixes by calling any of the McConaughay Licensees listed below. This co-ordinated group, guided by a central organization, is made up of experienced manufacturers and contractors who fully understand your problems, offer extensive engineering and testing services on paving materials and mixtures as well as on-the-job advice. Fully equipped to take on complete contracts or provide the laboratory facilities, emulsions and technical services required... they are always ready to work with you closely in solving your problems. Take advantage of this exceptional service. If you are figuring on highway, street, or general paving, get in touch with your nearest McConaughay Licensee or contact the main office.

SPECIFICATIONS OF THESE COLD-MIX PROCESSES AVAILABLE ON REQUEST

1—Penetration Macadam, 2—Open-Graded Plant Mix, 3—Open-Graded Road Mix, 4—Dense-Graded Plant Mix, 5—Dense-Graded Road Mix, 6—Mat Coat, 7—Seal Coat, 8—Sand Mix, 9—Sand Honing, 10—Patching, 11—Mastic Mix, 12—Driveway Construction.

McCONAUGHAY LICENSEES Operating K. E. McConaughay Emulsified Asphalt Plants

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53 Main St., Yarmouth, Maine
3. James Huggins & Sons, Inc.
Medford & Commercial Sts.
Malden 48, Massachusetts
6. Albany Asphalt & Aggregates
75 State St., Albany, New York
7. Knight Paving Products, Inc.
1655 Union Rd., Gardenville, N. Y.
8. Knight Paving Products, Inc.
Vine Street, Ithaca, New York
9. Knight Paving Products, Inc.
1980 East Avenue, Rochester 10, N. Y.
10. Knight-Bitumen Corp.
Watertown, New York



11. Senco, Incorporated
2700 Industrial Drive, Columbia, S. C.
 12. E. A. Mariani—Emulsified Asphalt
Hooker's Point, Tampa, Florida
 13. Bituminous Materials Co.
Metairie, Louisiana
Serving Alabama, Mississippi, and Louisiana
 14. Asphalt Products Co., Inc.
Powell Ave., Nashville 4, Tenn.
 15. Bituminous Materials Co.
P.O. Box 267, Terre Haute, Ind.
 16. Wabash Valley Asphalt Co.
Terre Haute, Indiana
 17. Brookman Construction Co.
17th & Gharkey Sts., Muncie, Ind.
 18. Fauber Construction Co.
Lafayette, Indiana
 19. Asphalt Materials & Construction, Inc.
960 E. 22nd, Indianapolis 2, Ind.
 20. Ready-Mix Asphalt, Inc.
P.O. Box 882, Fort Wayne 6, Ind.
 21. Walsh & Kelly
R. R. #2, Gary, Indiana
 22. Bituminous Materials Co.
416 S. Water St., Jackson, Mich.
 23. Bituminous Materials Co.
318 Atlantic St., Bay City, Mich.
 24. Emulsions, Inc.
Lawrenceville, Illinois
 25. Bituminous Materials & Supply Co.
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 27. Iowa City, Iowa
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One man can move hundreds of tons of rolling load with practically no effort. Economical, efficient, Carpullers are available for your specialized requirements.

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For more facts, circle No. 267

CONTRACTORS AND ENGINEERS

labor and materials connected or adjacent to the structure insured, materials, shanties, protective fences, bridges, or temporary structures, miscellaneous materials and supplies incident to the work and such scaffoldings, stagings, towers, forms, and equipment as are not owned or rented by the contractor, the cost of which is included in the cost of the work. This insurance does not cover any tools owned by mechanics, or contractors, equipment, scaffoldings, stagings, towers, and forms owned or rented by the contractor, the capital value of which is not included in the cost of the work, or any cook shanties, bunk houses, or other structures erected for housing the workmen. The loss, if any, is to be made adjustable with, and payable to, the owner as trustee for whom it may concern, except in such cases as may require payment of all or a proportion of said insurance to be made to a mortgagee as his interests may appear.

The contractor shall protect all materials and equipment located in, on, or about the construction site, including owner's property, from damage, injury, or loss through burglary, theft, or mysterious disappearance, except acts of God or the public enemy, and such as may be directly due to errors in the contract or caused by agents or employees of the owner. The contractor shall, if requested to do so by the owner, obtain and maintain insurance consistent with his responsibilities as herein provided.

Should the contractor cause damage to any subcontractor on the work, the contractor agrees, upon due notice to settle with such subcontractor by agreement or arbitration, if he will so settle. If such subcontractor sues the owner on account of any damage alleged to have been so sustained, the owner shall notify the contractor, who shall defend such proceedings in the owner's name at the contractor's expense, provided, however, that the owner may appear and, by attorneys of his selection, join in said defense. If any judgment is entered against the owner in said proceeding, the contractor shall pay or satisfy said judgment and pay all costs and attorney's fees incurred in such proceedings by the owner.

(To be continued next month)

Pioneer names engineer

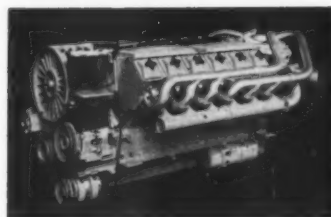
L. W. Mundy has been appointed chief bituminous engineer for the Pioneer Engineering Works, Inc., Minneapolis, Minn. In his new position, Mundy will be responsible for the design of all bituminous mix plants and the Vibromatic paver.

Air-cooled, turbocharged diesel engine available

■ An air-cooled, exhaust-turbocharged diesel engine, recommended for high-altitude operation of trucks, construction machinery, pumping sets, and diesel-electric sets, is available from the Diesel Energy Corp. The power plant is imported from Kloeckner-Humboldt-Deutz, AG, Cologne, Germany, and is available in two sizes.

The Deutz 8-cylinder engine weighs less than 2,000 pounds and has an automotive bare engine rating of 210 horsepower at 2,300 rpm. The 12-cylinder model has a bare engine rating of 310 horsepower and weighs less than 3,000 pounds.

The diesels can be run on straight diesel fuel, low octane gasoline plus



The new Deutz exhaust-turbocharged diesel engine has an automotive bare engine rating of 310 horsepower.

motor oil, or jet fighter fuel. The engines start and generate full power immediately. Air-cooling eliminates all winter freezing problems encountered in water-cooled engines.

For further information write to the Diesel Energy Corp., 82 Beaver St., New York, N. Y., or use the Request Card at page 18. Circle No. 75.

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Dragline Buckets

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See you at the ROAD SHOW — CHICAGO
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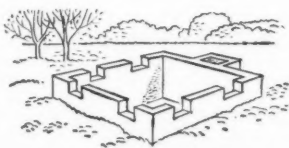
1/4 to 40 Cubic Yards

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foundations

EFCO Steel Forms for concrete construction are adaptable to wide use by their owners, including construction of house foundations. Other advantages:

- Lifetime steel faces should never need to be replaced.
- Easy to handle and assemble.
- Saves time, material, money.
- Low original cost.

Other forms from Economy are available on a rental basis. Write nearest office for catalog.

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For more facts, circle No. 268

Portable power tool converts to six uses



■ A portable power tool for carpenters and joiners can be converted for six different operations by means of several attachments. The Routo-Jig is manufactured by the Porter-Cable Machine Co.

The basic Routo-Jig Model 140 serves as a portable router or jig saw.

With the attachments the tool is said to do high-speed shaping, finish sanding, power planing, and dovetailing. The attachments can be interchanged in seconds, according to the manufacturer.

For builders and carpenters, the Routo-Jig is recommended for doing cut-out work. It speeds panel cut-outs and is handy for making curve or contour cuts. A cutter depth gage, for any cut up to one inch, is claimed to adjust quickly.

For further information write to the Porter-Cable Machine Co., 87 Exchange St., Syracuse 8, N. Y., or use the Request Card at page 18. Circle No. 99.

**This hoist is the most efficient
lightest, safest hoist in its
capacity class available today!**

The Coffing Super Power



Coffing Super Power hoists will give you more lift per pound of hoist and more lift per pound of handle pull than any other hoists in their class. Super Power hoists are available in six models from 1½ to 5 tons in capacity. Both the 1½ and 3 ton models are available in aluminum as well as the usual malleable iron. "Safety Valve" handles will bend before any load-bearing part can fail, and all hoists are tested at 100% overload.

Weight and bulk have been saved through the use of patented compound levers, rather than the conventional gears. These levers also give the hoists an increased efficiency of 85%. The operating handles may be adjusted for length and operated from either side of the hoists, and they cannot spin out of control.

For complete details write for Bulletin SP, Coffing Hoist Division, Duff-Norton Company, 810 Walter Street, Danville, Ill.

COFFING HOIST

DIVISION OF DUFF-NORTON COMPANY

For more facts, use Reader-Reply Card opposite page 18 and circle No. 270



The Ottawa Big Muscle backhoe now attaches to the Michigan 75-A tractor shovel.

Backhoe attachment has automatic ejector bucket

■ A backhoe with an automatic ejector bucket and two levers to control all operations is now available for mounting on the Michigan 75A tractor shovel. The Ottawa Big Muscle backhoe is available in two models that can be equipped with buckets from 12 to 36 inches in width.

The Model DX-75A digs to a depth of 11 feet and the Model EX-75A has an 8½-foot digging depth. According to the manufacturer, the automatic ejector bucket positively ejects wet or sticky materials without loss of

cycle time.

Power for the backhoe attachment is taken from the hydraulic system of the Michigan rig. All hydraulic cylinders are of the double-acting piston type, with chrome-plated rams. The backhoe is mounted on the tractor shovel by removing the shovel's rear counterweight.

For further information write to the Ottawa Steel Division of the L. A. Young Spring & Wire Corp., Fifth and Main, Ottawa, Kans., or use the Request Card at page 18. Circle No. 69.



Here's the business end of a heater

When you buy a heater, don't stand in front of it; stand behind it. All heaters are hot in front, but their value to you depends on the rear end.

If you want *circulated warm air indoors, powerful spot heating outside*, if you want *dry plaster, pour and cure concrete and keep the job rolling in any weather*, you need a Master heater.

It's a compact furnace-on-wheels, with starter, fan, thermostat, filter, pressure atomizing burner, insulated fire chamber and all. It rolls into place, starts at the flip of a switch, needs no vent and burns low cost kerosene or fuel oil.

We think it gives you more good heating for your money than any other type heater. Write for the free folder "Summer Warmth in Winter" or call your Master Distributor and see if you don't agree.

MASTER VIBRATOR COMPANY
308 Stanley Ave., Dayton 1, Ohio

MASTER

For more facts, use Reader-Reply Card opposite page 18 and circle No. 271

CONTRACTORS AND ENGINEERS

Huge 35-ton truck hauls 24 cubic yards struck

Capable of hauling 24 cubic yards struck is the new 35-ton truck announced by the Dart Truck Co. The Model 35 SL has a tubular 50,000-pound front axle and a 110,000-pound triple-reduction planetary driving axle.

The rig utilizes a 400-hp diesel engine driving through a downhill retarding torque converter and a spe-

cially designed 3-speed transmission. It rides on 32-ply tires, 18.00x25 on the front and 18.00x33 on the rear. If required, the cab can be equipped with an automatic air-conditioning system.

For further information write to the Dart Truck Co., 2621 Oak St., Kansas City, Mo., or use the Request Card at page 18. Circle No. 71.



◀ The 32-ply tires on the Dart Model 35SL truck alone are taller than a passenger sedan.

Coupler for muck cars operates automatically



The Mayo automatic coupler for narrow-gauge muck cars.

An automatic coupler for narrow-gauge muck cars, said to be safe and fast-acting, is announced by Mayo Tunnel and Mine Equipment. The

coupler is easily installed with bolts and reportedly costs only half as much as comparable equipment.

Made of cast steel, the new coupler engages in seconds, the manufacturer advises, from any position. One of its major advantages is that it eliminates the hazards of hand coupling.

For further information write to Mayo Tunnel and Mine Equipment, Box 1413, Lancaster, Pa., or use the Request Card at page 18. Circle No. 61.

talk about production!



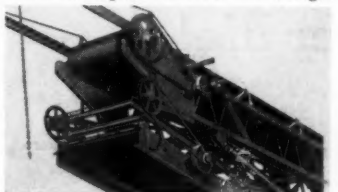
King-Size Kolman 42" Model 101 Loads 20-Ton Trucks in Less than a Minute

A giant producer is this 50'x42" KOLMAN 101 Conveyor-Screen Plant. On the application pictured it loaded 20-ton trucks in less than a minute while scalping out a large proportion of oversize rock in the production of sub-base material.

From three to four crawler tractors with dozer blades were kept busy in the pit feeding this hungry monster. It is equipped with dozer trap designed to facilitate dozer feeding. A complete line of other loading accessories is also available, including the feeder-trap combination, open type hopper and attached feeder, all fully portable.

The KOLMAN single-deck vibrating screen used on this plant is 9' long by 54" wide. Its design eliminates excess weight, making it possible to suspend this screening surface of over 40 square feet on the portable conveyor without extra supports. This plant can also be equipped with a double or triple-deck screen to produce various sizes of material in one operation, ideal for the simultaneous loading and screening of sand, gravel, ore, crushed rock, coal, limestone and similar materials. Spray bars can be added to provide an efficient, low cost portable washing plant.

Other features such as operator's platform, head pulley clutch, back-stop, extended engine controls and rugged design of the entirely portable plant make it the most complete and practical unit of its kind now available. These outstanding features are also available on smaller Model 101 KOLMAN plants of the same design.



Single-deck vibrating screen folds under end of conveyor for transporting. No disassembly of the driving mechanism is required.

SEND for FREE literature

KOLMAN Manufacturing Co.

4922 W. 12th St., Sioux Falls, S. D.

Please send literature on—

☐ 101 Heavy Duty Conveyor

☐ 202 Junior Conveyor

☐ Screens ☐ Feeders ☐ Traps

Quote — size or — capacity

Name

Address

City



Duff-Norton air jacks

Raise Big Loads—and Profits

By ingenious use of Duff-Norton air jacks, a Dallas contractor finds that he lowers costs, speeds work, gets greater dependability and safety with these portable tools on difficult installations of big equipment.

Using two 100-ton capacity Duff-Norton jacks, the mechanical contractor, E. E. Farrow Company, raised a 240,000 lb. turbo-generator 22 ft. at the plant of the Western Farmers Electric Co-operative. Three men completed the job in 2½ days with a jacking-blocking procedure which resulted in a savings of \$400.

Duff-Norton air motor jacks were also used to raise a 210-ton, 100,000-kw generator 13 ft. at the Dallas Power & Light Company, Parkdale Station. These same jacks helped cut costs of similar jobs at Haskell, Lone Star, Corpus Christi and Riesel, Texas.

Duff-Norton air motor jacks have a lift of 14 to 30 inches and are mounted on rubber-tired, roller bearing wheels for easy positioning by one man. They operate on 80 to 100 lb. air pressure.

The six Duff-Norton models range in capacity from 20 to 100 tons—weigh from 238 to 530 pounds. A sturdy base prevents tipping or settling. Safe operation is assured by an automatic shut-off which stops motor when safe limit is reached. Keyway in ram prevents the head from turning and shifting load. Lowering and lifting speed is controlled by air motor. Jacks will not creep or drop the load.

For data on these cost reducing jacks and name of nearest distributor write Duff-Norton Co., P.O. Box 1889, Pittsburgh 30, Pa. Ask for bulletin AD-11-S.

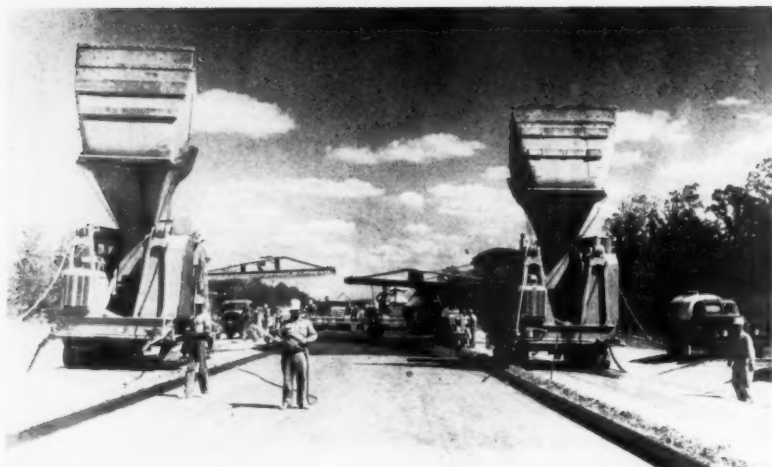
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The two Koehring 34-E Twinbatch pavers, supplied with water from International trucks carrying 1,000-gallon tanks, travel on the roadway shoulders. The workman, center, wets the base with a hand hose attached to the paver on the left. C&E Staff Photos

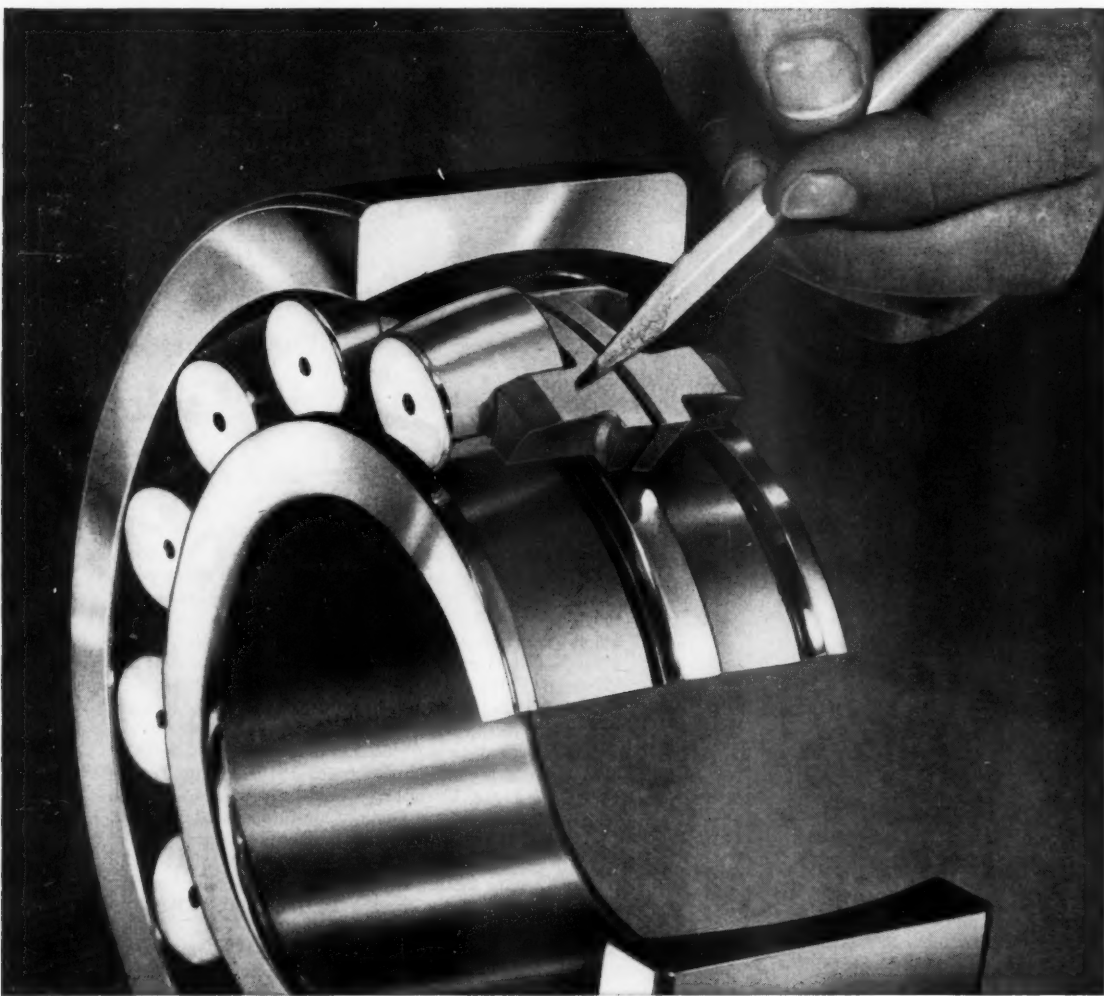
Twin pavers set pace on 21-mile paving job

Three months from the time subcontractor Koss Construction Co., Des Moines, Iowa, started work on a 21-mile paving project on U. S. 66 east of Hazelgreen, Mo., the job was finished. The project, completed just before cold weather put an end to the construction season, required 289,800 square yards of concrete on two 24-foot roadways of the 10.13-mile divided highway.

Difficult grading and the rough terrain of the Ozark plateau region of south-central Missouri prevented at least a substantial portion of the roadway from being ready for paving until the beginning of September. But even though the paving crew started this late in the year, it moved ahead swiftly. In the first nine days of actual paving, the crew put down 4.2 miles of 8-inch, 24-foot-wide concrete slab, and laid as much as 3,300 linear feet of roadway in a single day.

Grading and base work was completed by the general contractor, Porter-De Witt Construction Co., Poplar Bluff, Mo., which held the \$2,774,192.78 contract awarded by the Missouri State Highway Department, planner of the project. Subcontractor for the structures was Maxwell Bridge Co., Columbus, Kans. (See "Rock-cuts

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CONTRACTORS AND ENGINEERS

Conventional paving equipment plus shop-built rigs put down 4.2 miles of 8-inch slabs in nine days

By RALPH MONSON
field editor



Hot weather made the concrete set so rapidly that the paving train stayed bunched up. From left to right are a Jaeger spreader, two Jaeger finishers, a Koehring longitudinal finisher and a shop-built power belt machine.

and long hauls make tough grading job", page 56.)

Hauling rock and sand

In spite of the rocky nature of the country, there was no suitable concrete aggregate available. Crushed rock was shipped 70 miles by rail from Springfield, Mo., and sand was shipped 100 miles by rail from Pacific, Mo., to a rail siding at Richland, Mo. At the rail siding two Johnson cement augers were installed under the track to match the gates of the bottom-dump hopper cars. The augers, extending 30 feet from the track at an angle of 30 degrees, loaded two International trucks at one time. Jack Henry, Ottawa, Kans., subcontractor for the 10-mile delivery of the aggregates from Richland to the batch plant, used a fleet of nine International trucks, fitted with covered dump boxes carrying 30 barrels per load.

Since delivery of sand and aggregate could not match the pace of the two Koehring 34-E Twinbatch pavers, Henry began building stockpiles of these materials long before the actual paving started.

At the batch plant, cement was

(Continued on next page)

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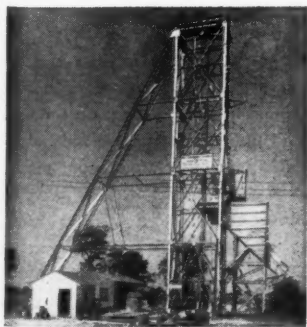
New Jersey Turnpike

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DECEMBER, 1956

UNION METAL
Monotube Foundation Piles

For more facts, use Reader-Reply Card opposite page 18 and circle No. 277

(Continued from preceding page)

dumped into a hopper and carried by screw and elevator conveyor to a Johnson cement plant with a 100-barrel storage silo. At the batch plant double weigh hoppers simultaneously loaded both compartments of the batch trucks with aggregates.

Two cranes handled the aggregates from the stockpiles to the bins. A Koehring 605 with a Johnson 2-yard clamshell bucket charged the two sizes of coarse aggregate into a Johnson 80-ton two-compartment bin. The other crane, with a Johnson 1 3/4-yard bucket, charged the Johnson 80-ton sand bin. Both of the hoppers were equipped with double weigh batchers to speed the loading of the batch trucks.



As many as 35 batch trucks, each carrying two of the 37.4-cubic-foot batches, hauled to the pavers. A typical batch contained:

Cement	783 pounds
Sand	1,622 pounds
2-inch stone	1,448 pounds
1-inch stone	1,448 pounds

Pavers work from shoulders

The two Koehring 34-E Twinbatch pavers traveled on both shoulders of the roadway being placed. In this way the subgrade was undisturbed between the last fine-grading operation and the placing of the concrete ahead of the spreader. Six to eight International trucks, each carrying 1,000-gallon tanks, hauled water from the Gasconade River to the pavers. As the pavers laid the concrete on the grade, a Jaeger spreader uniformly distributed the concrete over the section.

On the rear of the spreader was a device built in the contractor's shops for placing the center-joint tie bars. The drum-like device placed the 1/2 x 30-inch reinforcing bars at 30-inch spacings, and set the bars the proper distance below the top of the concrete slab. One man, riding on a platform at the rear of the spreader, placed the bars in the notches in the drum. On this job, the center-joint tie bars were wrapped with a section of waterproofing fabric near their centers to

prevent the center joint from rusting.

Two Jaeger finishers, following the spreader, were equipped with shop-built vibrating tamping bars consisting of a 2x12 plank cut to the crown of the roadway and fitted with a steel shoe. The bars, located under the frame at each end of the machine, were mounted on automobile springs and were vibrated by a rotating unbalanced weight belt driven from the finisher engine. These attachments did a good job of consolidating the concrete.

Pavement finishing

When joints were being formed in the soft concrete instead of being sawed, jointing operations caused most of the roughness in the pavements. With the sawing of joints, the pavements became smoother, but the irregularities caused by other factors became more conspicuous. The Koss crew made every attempt to finish the slab as smoothly as possible by using two finishing machines and two Koehring longitudinal bullfloats. These floats followed the finishing machines in the paving train. Hand finishing operations were done immediately behind the second longitudinal float.

Another device used to remove slight surface irregularities was a power belting machine. This device, built in the Koss shops from an old Flex-Plane jointing machine, was op-

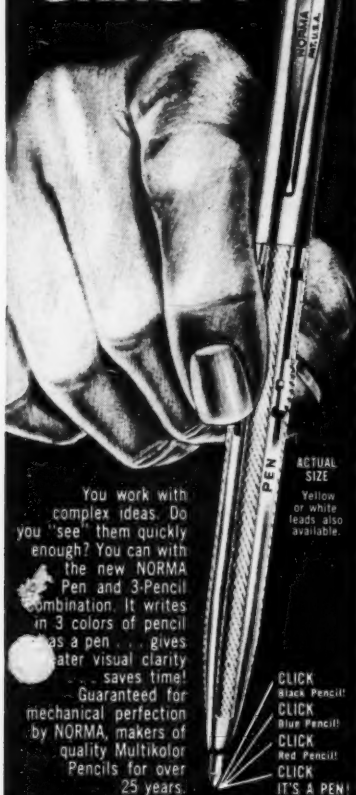
erated at a slow uniform speed, and stopped only when necessary. This uniform mechanical belting removed some of the slight irregularities which might have otherwise remained in the surface. A wet burlap drag applied the final finish.

Immediately following the finishing operations, Hunt Process Clear curing compound was applied to the surface by two hand sprays operated by small spray pumps. As soon as the forms had been removed, the edges of the concrete slab were coated with a curing compound by a workman using a small hand spray.

Joints were sawed by three Clipper ConSawMatic concrete saws using Clipper 14-inch abrasive blades. Sawing operations usually started about six hours after the concrete had been

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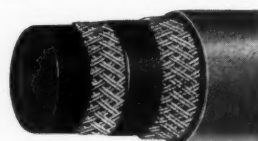
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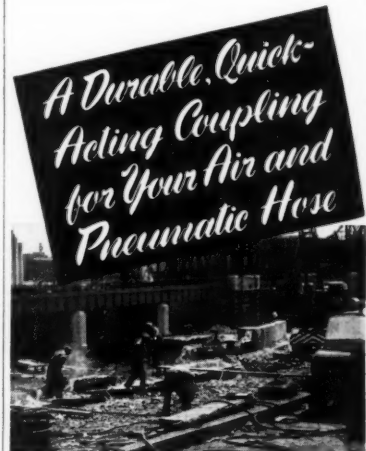
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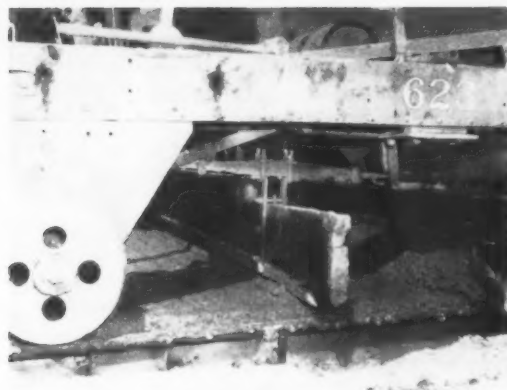
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CONTRACTORS AND ENGINEERS



A shop-built device, attached to the rear of the Jaeger spreader, placed the $\frac{1}{2} \times 30$ -inch center-joint tie bars at 30-inch spacings in the concrete slab. The man riding the platform places the bars in the drum notches.



This vibrating tamper attachment, built onto one of the Jaeger finishing machines, consists of a 2×12 plank, cut to the crown of the roadway and fitted with a steel shoe. A rotating unbalanced weight, belt-driven from the finisher engine, vibrates the tamping bars.

placed. Both longitudinal and transverse joints were sawed to a 2-inch depth and a $\frac{1}{4}$ -inch width.

Two of the saws ordinarily cut the transverse joints, which were spaced 20 feet apart, while the third saw operated continuously on the center joint. These saw blades averaged about 400 linear feet of 2-inch-deep cut per blade in the concrete, which was a hard limestone coarse aggregate. The saw averaged 4 feet per minute, including the time lost changing blades.

Water was supplied to the saws by two 1,000-gallon tank trucks, equipped with special fittings to permit the three saws to be connected at the same time. The sawing continued into the night until the joints had been sawed in the concrete placed that day.

The joints were cleaned and filled with Flintkote cold-applied rubber-asphalt joint-sealing compound, which was pumped by Graco pumps from the barrels and forced into the joints through a special thin nozzle which carried the compound to the bottom of the joint. The sealing crew used an International R-160 truck to carry the Jaeger 75-cfm compressor and two barrels of compound, each of which was fitted with one of the Graco pumps. Only one pump was used at a time; the other served as a standby. The truck also carried a small Schramm compressor for emergency use.

Modified grader

Where necessary, a Caterpillar No. 12 motor grader spread the base material or shaped the roadbed. A Cleveland form grader then cut out the trenches for the forms, and the form crew placed the forms immediately. The base was then cut to the proper grade and shape by an R-B Fine-grader. This machine had also been modified in the shop by extending the elevator to carry the excess base material up and dump it into a truck instead of dumping it on the shoulder. When this truck was loaded, it carried the material ahead to a point where additional base was required. In this way the valuable base material was not wasted on the shoulders.

Behind the Finegrader, a Huber 10-ton roller thoroughly watered and compacted the base. A planer and

(Concluded on next page)



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The sludge on that tow car hook spells big trouble for your construction equipment. Grit and dirt picked up by Diesel fuel and motor oil can do real damage to fuel injectors, cylinders and bearings. Your downtime and maintenance costs go way up, unless gritty sludge is removed constantly by effective filtration—WIX Engineered Filtration.

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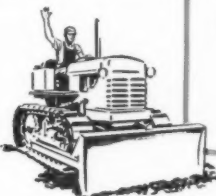
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(Continued from preceding page)

check template, pulled by an Oliver wheel tractor, left the base in perfect shape for the paver.

Equipment maintenance

A special setup at the batch plant provided a large supply of spare parts and a complete lubricating and maintenance setup for the trucks. Road equipment was maintained and lubricated by another special crew equipped with a mobile lubricating rig. An equipment mechanic traveled with the paving equipment, using every delay to make adjustments, lubricate, or repair the rigs. An oiler on each of the cranes handled the lubrication of the machine. This careful maintenance kept each piece of

equipment in top operating form.

Little things around the job indicated the contractor's interest in the comfort as well as the efficiency of his crew. Each machine in the paving train had a sun umbrella to protect the operator on hot days. An ample supply of cold drinking water was always available. Efficiency of the overall operation was also improved by the use of a General Electric mobile radio system. With a base station in the field office, and mobile sets at the batch plant, in the Ford Ranchwagons of the two superintendents, and in the paving forman's pickup, all parts of the operation were coordinated.

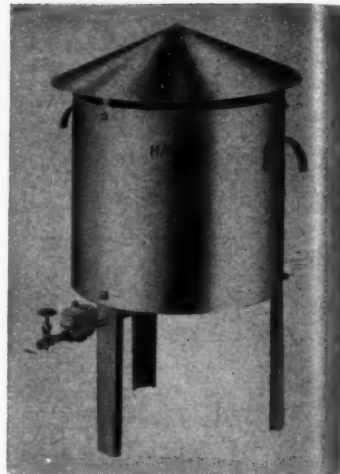
General superintendent for Koss Construction Co. in its Missouri operations is A. M. "Al" Beuerlein. Pav-

ing superintendent was Lawrence Beuerlein, and Glenn Ryan was superintendent of the grading. Resident engineer for the Missouri State Highway Department is Dale Carney, and his assistant is Bob Meyers. This job was done under the jurisdiction of the Springfield District of which G. E. Wolf is district engineer. Construction engineer for the department is J. J. Corbett, and chief engineer is Rex M. Whitton.

THE END

L. B. Foster adds to staff

Angus A. Coughlin has joined the New York sales department of the L. B. Foster Co. of Pittsburgh, Pa. For the past eight years, Coughlin has held various positions with the Connecticut General Life Insurance Co.



The Hauck chamber salamander.

Salamander in two sizes is operated by LP gas

A heavy-duty chamber salamander that burns LP gas is announced by the Hauck Mfg. Co. The unit is available in two sizes; one produces 150,000 Btu per hour while the other is rated at 225,000 Btu per hour.

The new salamander has a shell and hood of 16-gage steel and stands on 10-gage channel legs. It is fired by either a low pressure or high pressure internal jet gas burner. The low pressure burner is for use with LP gas at 11-inch water column and is furnished with an automatic safety shut-off and control valve.

The high pressure burner is for gas at from 10 to 25 psi and is furnished with a control valve; the automatic safety shut-off is optional. The heating chamber radiates and circulates air downward and outward by means of the conical cover. According to the manufacturer, the salamander is smokeless, fumeless, and sootless.

For further information write to the Hauck Mfg. Co., 116-126 Tenth St., Brooklyn, N. Y., or use the Request Card at page 18. Circle No. 57.

Lima Crane with Twin Disc Single-Stage Torque Converter "...fastest thing we own" says Ohio Contractor

"I've watched this machine carefully, and it is the fastest thing we own," says Assistant Project Engineer Jack Hickey, of Baker & Hickey, Columbus, Ohio, contracting firm. "This is the smoothest . . . too, especially on pile-driving operations. And I know the torque converter is absorbing those tremendous shocks."

Mr. Hickey is talking about his firm's new Lima Model 44, 25-ton

Crane equipped with one of the new Twin Disc 1500 Series Single-Stage Torque Converters . . . and the underpass and bridge construction work it is doing on the Columbus and Sandusky Expressway.

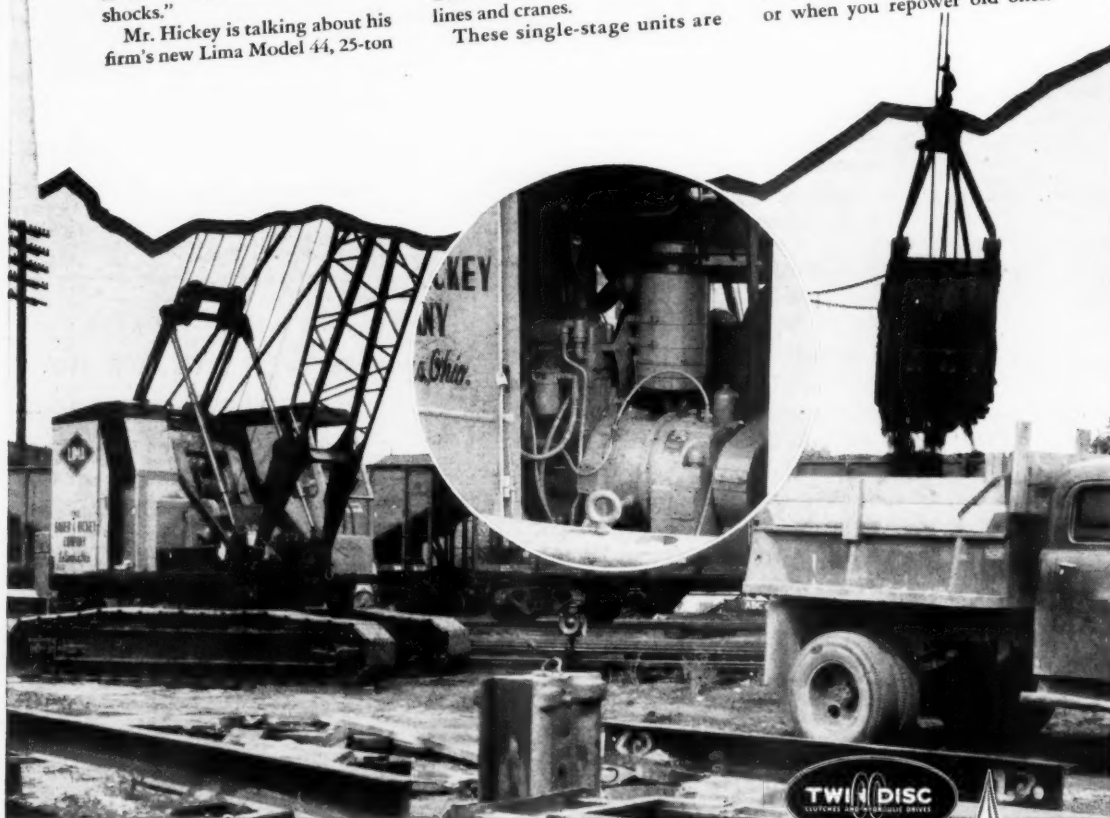
Like Baker & Hickey, more and more contractors are specifying Twin Disc Single-Stage Torque Converters in their shovels, draglines and cranes.

These single-stage units are

designed expressly for just such work. They provide smooth torque multiplication to just the exact ratio required, and permit delicate "inching" or "holding" of loads under power.

Fluid connection cushions out damaging shock loads and vibrations, protecting both driving and driven equipment. The result is reduced maintenance costs, extended cable life, increased profits!

Specify Twin Disc Torque Converters for your new shovels or when you repower old ones.



Write today for full details on Twin Disc Torque Converters — both single-stage and three-stage.

Left, Baker & Hickey's new Lima 25-ton Crane loading with a clamshell bucket at Columbus, Ohio. Inset. Powered by a Cummins JBIS Diesel Engine, the Lima Crane uses a Twin Disc Single-Stage Torque Converter to transmit power smoothly and efficiently.

TWIN DISC
Torque Converters

Twin Disc Clutch Company, Hydraulic Division, Rockford, Illinois

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of

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Crane-
Excavator

196E56-d

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CONTRACTORS AND ENGINEERS

The new model Insley carrier-mounted crane has a lifting capacity of 12½ tons. The carrier has a turning radius of 24 feet and is self-propelled.

Crane mounts on carrier with 24-foot turn radius

■ A new model carrier-mounted crane with a lifting capacity of 12½ tons is announced by the Insley Mfg. Corp. The carrier rides on four 10.00×20, 12-ply tires and has a turning radius of 24 feet. The crane measures 14½×10 feet.

The new model mounts a Type K upper works and is self-propelled. It is one-man operated and is convertible to the full range of front-end attachments, the manufacturer reports. Standard equipment on the upper works includes independent boom hoist, brake-type cab lock, boom backstop, and double hook rollers.

The carrier is equipped with air brakes and hydraulic steering. The standard boom length is 30 feet. Independent travel is optional. Optional equipment for the carrier includes a tow-bar attachment and a spring-actuated, air-released parking brake attachment.

For further information write to the Insley Mfg. Corp., P. O. Box 167, Indianapolis 6, Ind., or use the Request Card at page 18. Circle No. 97.

W-S Fittings organizes Southeastern territory

The W-S Fittings Division of H. K. Porter Co., Inc., Roselle, N. J., has started full operations in its Atlanta, Ga., office. The office, located at 267 E. Paces Ferry Road, will serve the states of Florida, Georgia, Mississippi, Alabama, North and South Carolina, and Tennessee.

James M. Tough is the manager of the new office.

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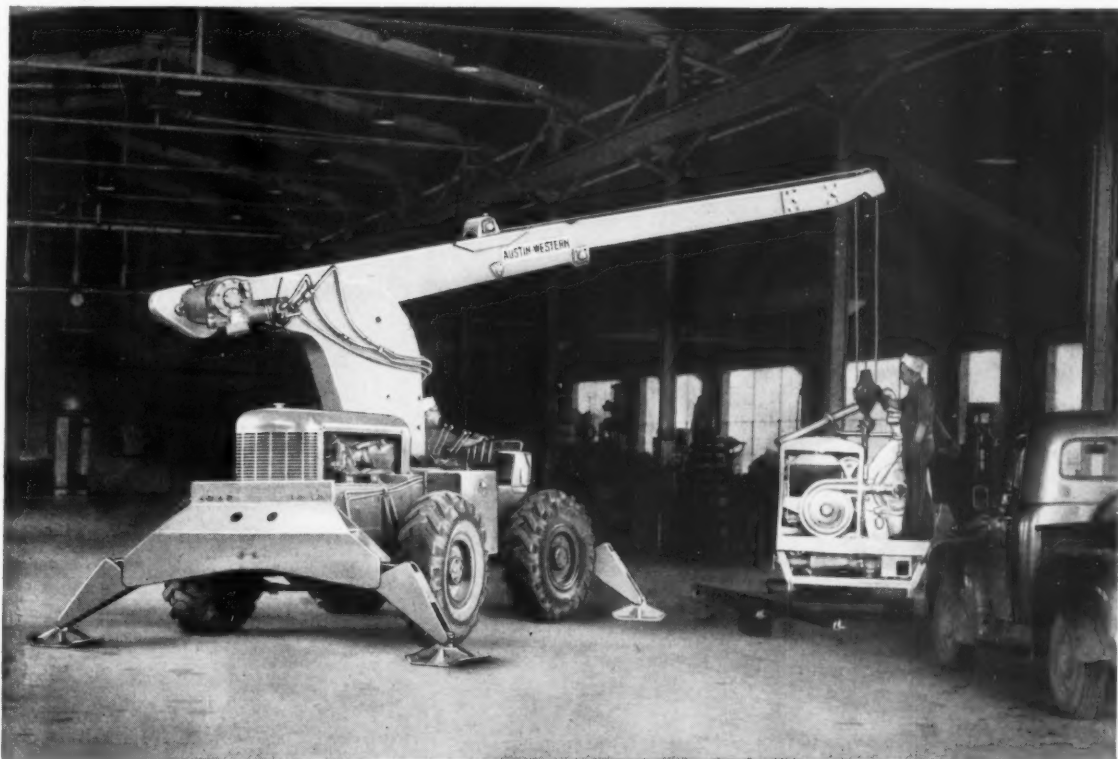


Sand making, classifying

■ A bulletin describing a machine that hydraulically makes and classifies sand is available from Meckum Engineering, Inc. With the Meckum-Floatex plant, sand can be made to any number of gradations provided the particles are in the original deposit. According to the catalog, the entire operation is automatic; the only moving part is a rubber-lined dredge-type pump. In addition to explaining in detail the operation of the sand plant, the bulletin shows a typical compact layout.

To obtain Bulletin No. 900 write to Meckum Engineering, Inc., Dayton Road, Ottawa, Ill., or use the Request Card that is bound in at page 18. Circle No. 77.

AUSTIN-WESTERN HYDRAULIC CRANE a great Contractor Tool says John G. Yerington



"Our hydraulic crane is a service unit which, therefore, should be available at all hours, to lower the downtime on more expensive equipment and save the time of our own and our copartners' gangs of men on a job."

"One of the commoner services our hydraulic crane is called upon to perform is changing wheels and heavy tires on other equipment. The 16.00x20 tire on a grader carrying 1½ barrels of water for weight used to be changed by 3 or 4 men by main force and ignorance. Now with the hydraulic crane 2 men make the change in a fraction of the time."

"We maintain 4 storage yards, and since they are not served by overhead cranes, our hydraulic unit is especially valuable there."

"In handling the Benton Harbor airport contract, we laid

¾ of a mile of 24" corrugated metal and reinforced concrete pipe with great success. Our Austin-Western hydraulic unit is so accurate that we can lower pipe ¼" or ⅛" at a time for better and faster pipe fitting. It is easy to handle mixed concrete to the second or third story of a building."

"Our Austin-Western hydraulic crane has the mobility that enables it to go practically anywhere and be of service in dozens of different ways. Its large 14.00x20 tires and their good grip on the ground make it possible to go through sand or wet or loose soil where many other kinds of equipment would have trouble. Four hydraulic stabilizers allow a wide boom swing."

For the complete Yerington story, ask for Gould Certified Report No. 5605.



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Please send complete Gould Certified Report No. 5605.

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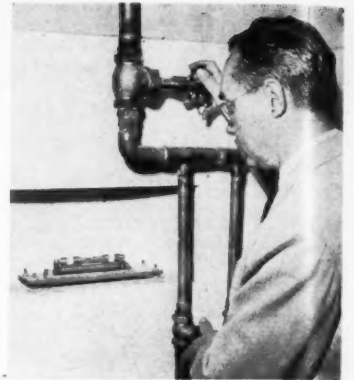
For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 285



The bank's 150-ton vault is floated on four Duff-Norton Model 126 RX rotary air motor-powered screw jacks, one of which is pictured above. Each 448-pound jack can raise 75 to 100-ton loads to 14 inches in a few minutes.

Jacks prevent sinking of heavy bank vault

Spirit levels, set into the walls beside the control valves, indicate when the vault has shifted. A twist of the valve activates the jacks and the vault is immediately returned to its desired position.



Filled-in marsh presents foundation problems; jacks equalize settlement in new building

Contractors working on structures at the new San Francisco International Airport in California are building with an eye toward a disturbing fact—buildings not on concrete piling are expected to settle 20 inches in the next four decades. The airport, located on San Francisco Bay, was once a tidelands and marsh area and was filled in with six to eight feet of compacted earth. The Bank of America was faced with a foundation problem in this filled-in area in designing and constructing its new International Airport branch office.

A soil investigation of the airport showed that over a 40-year span the Bank's 150-ton vault would settle more than the rest of the branch building, so much so that there would be a 10-inch variance due to the difference in weight between the two portions of the same building. This would occur even though the branch was constructed on top of a concrete mat, as the vault could twist away from the bank, or sink to such a depth that banking officials might one day

be unable to open the vault's 3½-ton steel door.

Vault floated on jacks

Through its contractor, the Continental Service Co. of San Francisco, the Bank of America decided to float the vault on four heavy Duff-Norton Model 126 RX rotary air motor-powered screw jacks. Each jack weighs 448 pounds and stands 26 inches high. With a base diameter of 13 inches and a head diameter of 6½ inches, each jack can raise 75 to 100-ton loads to 14 inches in a few minutes.

To use the jacks effectively, the vault was built separately from the building proper, but in such a way that it adjoined the main building on two sides. Both parts of the building were placed on separate concrete mats.

The concrete mat under the bank was designed for a soil pressure of 150 pounds per square foot. The other mat, designed for soil pressures of 444 pounds per square foot, was laid to the exact size of the vault base. Then

MORE POWER TO YOU

FOR THE

HIGH
LIFT

M-H-F Model 202 Fork Lift
Power: Continental Red Seal Z-134 Engine

Like other leading makes of industrial tractors, Massey-Harris-Ferguson's newly-introduced WORK BULL line of light- and medium-duty utility units—gasoline and Diesel—features the plus value of power by Continental Motors, engine specialists since 1902.

• PARTS AND SERVICE EVERYWHERE •

Continental Motors Corporation

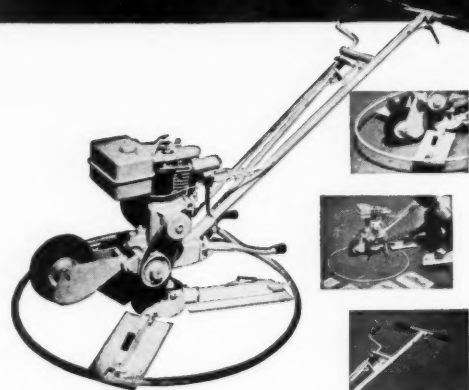
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For more facts, use Reader-Reply Card opposite page 18 and circle No. 286

Only one man to move a

White TROWELER



Retractable wheel, up to trowel, down to move.

Remove blades and ring in seconds... for cleaning, changing blades, or moving through doorways.

Adjust blade pitch during rotation from handle. Safety throttle control stops rotation if operator lets go handle.

PORTABILITY, patented, exclusive! PERFORMANCE, unbeatable! PRICE, comparable to trowelers without these features! Model T-1, 36" diameter, Patent No. 2,621,568.

White MANUFACTURING COMPANY

ELKHART 9, INDIANA

For more facts, use Reader-Reply Card opposite page 18 and circle No. 287

CONTRACTORS AND ENGINEERS

a concrete box, of a sufficient height to permit the jacks to operate, was poured atop the mat and the jacks were set in each of the four corners of the box. An 18-inch-thick reinforced-concrete floor for the vault was poured on the jacks, and on this floor, 18-inch vault walls and ceilings were erected. An equipment room containing an air compressor and related machinery was installed on top of the vault.

Control valves inside the vault regulate the compressed air, which in turn controls the pressure in four separate air pipes connected to the jacks. The air compressor develops 230 pounds per square inch, but a reducing valve brings compressed air to the jacks at only 90 pounds per square inch.

Two spirit levels, which enable bank officials to tell when the vault has shifted, are set in the vault's concrete walls on both sides of the control valves. A turn of the valve activates the jacks and the vault can be returned immediately to the desired position.

Matchmarks, inscribed on the bank wall and the vault wall facing the main banking room, also indicate level changes.

Bearing out engineers' calculations, the vault has settled about one inch more than the rest of the building, but the jacks have equalized the variance.

THE END

Atlas Powder appoints

The Atlas Powder Co. of Wilmington, Del., has realigned its central engineering department into three sections and has appointed Frank Irwin head of the construction services section; Wilbur H. Kordt, head of the design section; and Frank C. Gromann, manager of the industrial services section. Chief engineer J. Charles Allen will direct the department.

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the LOOP
CHICAGO

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from \$4 single

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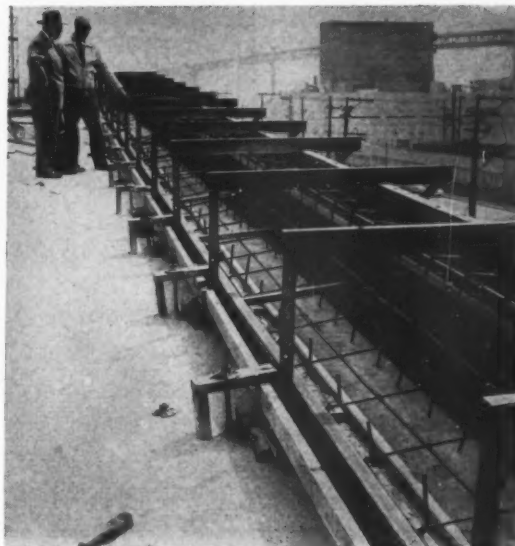
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NEW
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For more facts, circle No. 288

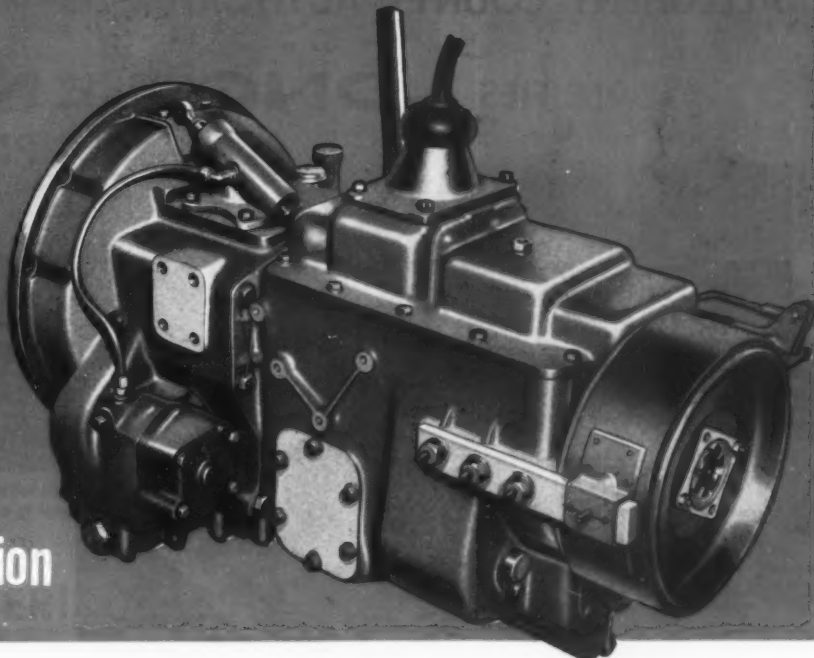
REINFORCING RODS IN PLACE, these specially designed Blaw-Knox steel forms for curbing and parapet walls on part of the San Francisco Freeway system are ready for the pouring of concrete. The forms, said to last through 300 to 400 pours, are constructed in 5-foot sections with screw-jack and lap-plate adjustments for vertical curvature and super-elevation. The same 5-foot sections were used to form the curves, as well as the straightaways on the job. The sections are bolted together and require no tie rods; curbing and wall plates are connected with cantilever bars which clear the top of the concrete surface with several inches to spare. For more information circle No. 41 on the Request Card at page 18 or write to the Blaw-Knox Co., 300 Sixth Ave., Pittsburgh, Pa.



NEW ! the CLARK TransVerter

COMPACT
UNIT
"PACKAGE"
OF

- * Torque Converter
- * Hydraulic Clutch
- * Transmission



Now comes more profitable performance for the operators of stop-and-go vehicles—trucks, both highway and off-the-highway, garbage and trash collectors, concrete mixers, materials handling machines and others: smoother, more economical handling made possible by Clark's new TransVerter.

- No heavy clutching—reduces driver fatigue. Easy control of hydraulic clutch by shift lever button, floor button, or light pressure clutch pedal
- Longer life for entire drive-train—no shock-loading
- Less wheel slip—Tires last longer
- Fine inching control with accelerator
- Clutch adjustment eliminated—Result: savings on costly down time
- Gear shifting reduced appreciably. Gear changes made quicker
- Excellent accessibility for easy service. Serviceable without special tools by any mechanic familiar with transmissions
- Closely spaced ratios add to ease of shifting resulting in added transmission life
- Available for OEM or field conversion
- Starts smoothly, no stalling, no lugging

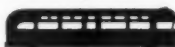
Get the interesting story of these advantages whose economies far offset the moderate additional cost. Send for bulletin.

CLARK EQUIPMENT COMPANY, Transmission Division, Falahee Road, Jackson 7, Michigan
Please send the TransVerter Bulletin

NAME _____
COMPANY _____ POSITION _____
ADDRESS _____
CITY _____ ZONE _____ STATE _____



Trucks Operating
on delivery schedules



Coaches making frequent stops



Garbage and trash collection



Concrete mixers and
similar industrial applications



Materials handling machinery



Many stationary power plants
and oil field applications

**CLARK
EQUIPMENT**

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 289



The new Anthony frameless dump trailer unit.

Frameless dump trailer permits extra payload

■ A substantial increase in legal payload is reportedly possible with the new frameless dump trailer unit announced by the Anthony Co. The trailer, available with a single or tandem axle, utilizes the Anthony Tel-eramic hydraulic hoist.

The hoist mounts on the tractor's fifth wheel, eliminating the conventional trailer frame and other lifting mechanisms. The dump body serves as its own trailer frame and the rear axle of the trailer acts as the hoist hinge point.

According to the manufacturer, an Anthony single-axle frameless semi-trailer unit with a single-axle tractor will haul up to 2 tons more legal pay-

load than can be hauled with a tandem-axle dump truck.

Because the hoist works off the fifth wheel and there is no conventional frame, traction, maneuverability, and stability are greatly increased, the company points out. By setting the tractor brakes and raising the dump body, the trailer wheels can be pulled out of soft spots. By raising the dump body, locking the trailer brakes, and then lowering the body, the tractor wheels can be pushed out of mud or holes.

Maneuverability is increased because the wheelbase can be shortened by raising the body. A three-point hoist mounting keeps the trailer body under control when dumping at sharp angles or on uneven ground, the manufacturer points out.

For further information write to the Anthony Co., Streator, Ill., or use the Request Card at page 18. Circle No. 70.

Sewerage construction

■ A case-history report on the problems of infiltration and exfiltration in new sewerage construction has been prepared by the Robinson Clay Product Co. The report describes Wedge-Lock clay pipe joint, its application in a typical installation in which infiltration and exfiltration problems exist, and the ease with which it can be installed and backfilled in water-logged trenches. Complete descriptions of the necessary adhesives and fittings used with Wedge-Lock, as well as of the installation technique, are included.

To obtain Bulletin R-656-9 write to the Robinson Clay Product Co., 65 W. State St., Akron 9, Ohio, or use the Request Card at page 18. Circle No. 91.

Progress in Pittsburgh....

ALLEGHENY COUNTY AUTHORITY

SPECIFIES LONG LENGTH CONCRETE PIPE

with

RUBBER and STEEL
AMSEAL JOINTS



In keeping with Pittsburgh's remarkable record of progress, the Allegheny County Sanitary Authority is presently constructing an \$80,000,000 combined sanitary and storm sewerage system designed to serve 70 communities. Pittsburgh's famous rivers and streams will benefit enormously from this big cleanup job which is one of the largest of its kind in the United States.

American-Marietta's up-to-the-minute facilities in Pittsburgh are supplying many miles of high-quality, long-length concrete pipe with Amseal Joints to many of the nation's leading contractors for their work on both tunnel and open-cut interceptors. Approximately 50 varying sizes and designs are being made on schedule to meet the project's anticipated completion date.

The Amseal rubber and steel joint provides positive protection from both leakage and infiltration while the hard, dense, high-strength concrete guards against devastating and erosive sewage. Long lengths (16 ft.) speed installation, reduce number of joints, and mean real savings to owners both in construction and in operation.

Our technical staff will be pleased to assist you with your pipe problems.



AMERICAN-MARIETTA COMPANY CONCRETE PRODUCTS DIVISION

GENERAL OFFICES:

AMERICAN-MARIETTA BUILDING

101 EAST ONTARIO STREET, CHICAGO 11, ILLINOIS, PHONE: WHITEHALL 4-5600
For more facts, use Reader-Reply Card opposite page 18 and circle No. 290

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We Rebuild—Repair—Re-
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BIG PECKERWOOD BIG
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Steel Wire Road Drag Leveler, Six (6) Inches Wide
—Name Your Length

Not STAPLE set
In Stock Lengths of 4-6-8-9-10 or 12 foot.
Only \$3.50 Foot. "Approx. wt. 5 1/4 lbs. per ft."

NO FRAME REQUIRED
The LITTLE PECKERWOOD
3" Wide, 15" Length
Takes Fits Your Frame
NOTE—Both Drags
Can Be Furnished
with Fibre.
Only \$2.50 Ea.

KENNEDY'S
Since VAN BRUSH MFG. CO., INC. 1928
327 Southwest Blvd., Kansas City, Mo.

For more facts, circle No. 291

CONTRACTORS AND ENGINEERS



The Cleaver-Brooks PS-125 portable steamer.

New portable steamer offers close control

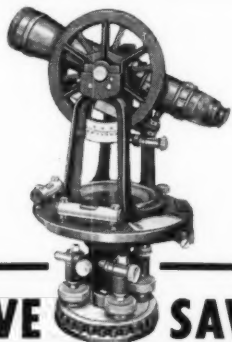
■ The new portable steamer announced by the Cleaver Brooks Co. is said to offer a maximum of control for pile-driving operations. The PS-125 has one control that provides fully modulated regulation from low fire to high fire for all steam demands, according to the manufacturer.

The new steamer delivers 4,300 pounds of dry steam per hour from a cold start in 30 minutes. Dry steam is the best source of power for pile driving, the manufacturer advises. The steamer is said to give single and double-acting hammers full rating in the maximum number of blows through the pile-driving cycle.

The PS-125 has a capacity of 132 gallons of No. 2 fuel oil in its two fender tanks. It is available with a two-axle running gear or a skid-mounting. The unit is also recommended for heating asphalt, winter thawing, cleaning of equipment, and heating of enclosed areas.

For further information write to the Cleaver-Brooks Co., 326 E. Keefe Ave., Milwaukee 12, Wis., or use the Request Card at page 18. Circle No. 116.

ENGINEER'S TRANSITS



SAVE SAVE

**ONLY 26 POWER HEAVY
\$345.00 DUTY MODEL T-26
EQUAL IN QUALITY TO TRANSITS
SELLING FROM \$650.00 TO \$750.00**

A precision instrument. Minimum focus is 6½ ft. Magnification is 26x. Readings down to 20 seconds. MODEL T-18, is a Utility Model for only \$189.50. Save over \$300 on this brand new equipment. Atlas Transits are field tested and accepted by engineers, contractors, builders. Complete with Tripod and Accessories. Sold only on a money back guarantee. Non rated D&B firms — \$25 deposit — balance C.O.D. Send to Dept. CE.

**ATLAS INSTRUMENT CO.
611 PEARL ST. SIOUX CITY, IOWA**

For more facts, circle No. 292

DECEMBER, 1956

Threaded nails used more as costs are reduced

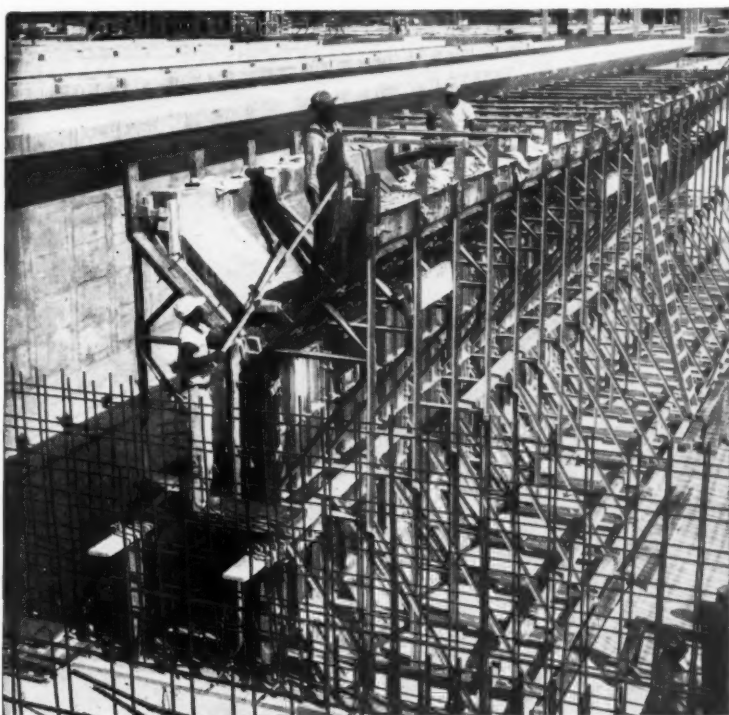
■ The price of the Ardox spiral nail has been reduced by 5 per cent, according to the Jones & Laughlin Steel Corp. J & L is now manufacturing the threaded nail in the U. S. under an agreement with The Steel Co. of Canada, Ltd., which developed the nail and the process for producing it.

According to J & L, the spiral nail has these advantages over the common smooth shank nail: increased holding power, easy driving, reduced wood splitting, and lower cost per nail. According to the company, it is now possible to market the Ardox nail at a lower price per nail than the

smooth shank nail.

The spiral nail is threaded right up to the head. When it is driven home, it does not cut the wood fibers but tends to push them aside. Later, the fibers resettle into the grooves of the spiral, creating extra holding power, the company points out. The holding power is said to drastically reduce creeping due to the seasoning of the wood.

For further information write to the Jones & Laughlin Steel Corp., 3 Gateway Center, Pittsburgh 30, Pa., or use the Request Card at page 18. Circle No. 121.



Special Y wall forming system makes for simplified stripping operation. 100% reusability of all materials. Note complete absence of lumber normally required for shoring and bracing on this type of structure.

CUTS MATERIAL COSTS with Pre-Fab Form System on Sewage Plant Job

In the construction of the Miami Sewage Treatment Plant Job the Paul Smith Construction Co., of Miami, Florida chose to use the Uni-Form Panel System in the forming of one million sq. ft. of contact area. The contractor estimated that the use of the Uni-Form System saved 40 percent in material costs alone. In addition, faster form erection with fewer men kept the job moving ahead of schedule and reduced estimated labor costs considerably. These fine results were obtained even though this was the contractor's first experience with the Uni-Form Panel System.

This considerable savings in material and labor was realized in spite of intricate Y wall forming and pipe intersections which causes complicated forming problems with conventional forming systems.

Pre-fabricated, ready to use—completely engineered to handle most forming problems, the Uni-Form Panel System provides such advantages as simple assembly—minimum one side alignment and bracing—automatically accurate wall widths—positive internal spreading—faster stripping and maximum re-use to give the contractor lowest all around form costs.

Y wall trusses designed to member with

standard Uni-Form Panels formed a completely automatic system for handling the special forming problems, and were big factors in the economy and speed obtained on the job. Simple assembly of Standard Uni-Form Panels on the trusses eliminated many of the aligning, bracing and spreading problems usually encountered in Y wall construction. In addition to simplified forming the combination system of standard Uni-Form Panels and trusses eliminated many of the problems normally encountered in the stripping of a wall section of this type. The contractor was well pleased with all phases of his forming and stripping operations.

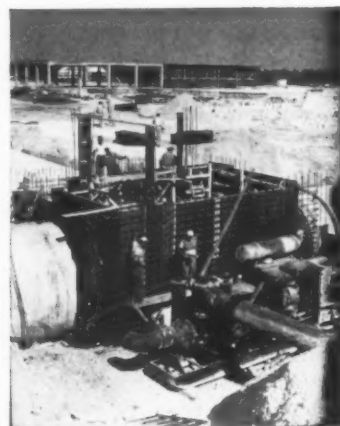
Why not investigate the many advantages the Uni-Form Panel System can bring to you? Write for the Uni-Form Catalog—or better yet, send us a set of plans for an estimate on your next job. Let us prove to you as we did to the Paul Smith Construction Co., that the Uni-Form Panel System can cut your forming costs.

UNIVERSAL FORM CLAMP CO.

1238 N. Kostner Avenue • Chicago 51, Illinois

Branch Offices and Warehouses:

Los Angeles • San Leandro, Calif. • Houston, Texas
Cleveland, Ohio • Baltimore, Md. • Atlanta, Ga.



Intricate forming in restricted areas presented no problem. Uni-Form Panels erected aligned and braced one side eliminated difficulties normally encountered in placement of reinforcing steel. Note Uni-Form Panels around large precast pipe.



One side aligning and bracing provides clear unobstructed working areas increasing job efficiency.



Y wall trusses incorporated alignment, bracing, shoring and scaffolding requirements.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 293

A new body design and fewer parts in the operating mechanism permit the Baughman Model SST-11 bulk cement transport body to carry larger payloads.



Bulk cement transporter carries larger payloads

■ A bulk cement transport body designed to handle larger payloads and to permit faster discharge of any dry, free-flowing, non-abrasive material such as cement or fly ash, is announced by the Baughman Mfg. Co. The transport body is called the Model SST-11.

A new body design and an operating mechanism that has fewer working parts reportedly permits the increase in legal payload. Truck or trailer units are available fabricated of aluminum, magnesium, or steel in lengths of from 10 to 34 feet. The units have an over-all height of 70 inches and an over-all width of 87 inches.

Faster discharge has been accomplished by means of a 9-inch auger located in the bottom of the body, which has 45-degree sloping sides. The body compartments and trip doors keep the weight of the material off the auger and allow selective unloading if necessary, the manufacturer reports. Unloading speeds up to 2 tons per minute are possible, depending on the material, the company reports.

For further information write to the Baughman Mfg. Co., 192 Arch St., Jerseyville, Ill., or use the Request Card at page 18. Circle No. 79.

Line of metal products

■ The line of metal products manufactured by Armco Drainage & Metal Products, Inc., is pictured in a folder from the company. Job photos show applications in pipelines, buildings, retaining walls, conveyor trestles, and rolling doors. Pertinent specifications and data are included on each product described.

To obtain the folder write to Armco Drainage & Metal Products, Inc., 703 Curtis St., Middletown, Ohio, or use the Request Card at page 18. Circle No. 6.

Improved records control

■ How operating costs can be decreased and greater profits achieved is explained in a new illustrated booklet from the Remington Rand Division of the Sperry Rand Corp. The literature outlines various methods of improving management and records control.

To obtain Bulletin BSD 45 write to Remington Rand Division, Sperry Rand Corp., 315 Fourth Ave., New York 10, N. Y., or use the Request Card at page 18. Circle No. 90.

Power train unit

■ The TransVerter, a power-train unit comprised of a torque converter, disconnect clutch, and transmission, is described in a bulletin from the Clark Equipment Co. Designed for off-highway and stop-and-go service, the unit has a rated engine torque of up to 325 foot-pounds. Complete specifications and dimensions are given in charts.

To obtain Bulletin No. TV-100 write to the Transmission Division, Clark Equipment Co., 1300 Falahee Road, Jackson, Mich., or use the Request Card at page 18. Circle No. 9.

TURNPIKE TESTS PROVE:

"75" PAYSCRAPER®

CARRIES

12% more...

DELIVERS IT

15% faster

.....

TD-24 pusher

An International TD-24 tractor and "75" Payscraper recently out-pushed, out-loaded, and out-spied all equal-sized competitive units in accurate on-the-turnpike tests. This data was obtained on the Illinois toll road job near Rockford.

All tests were conducted under similar conditions on the same cut, in the same material, and under the supervision of the contractor's grade foreman. Loading time was limited to exactly one minute. Scraper loads were weighed on special new accurate scales. Haul length was held to 2,000 feet for all scrapers.

Final figures amazed all observers! Results showed first, that the "75" Payscraper carried 12% more dirt per load...delivered it 15% faster than the other two scrapers tested; second, that the TD-24 torque con-

Load-Speeding Action. High horsepower-to-weight ratio and speeds up to 24 mph—plus operating ease of air-assisted clutch; big, safe, 4-wheel air brakes; exclusive Hydro-Steer—all help the Payscraper gain time, increase earth-moving capacity!



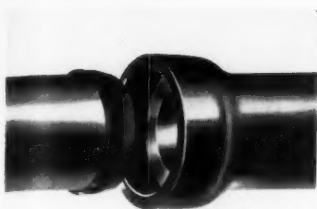
verter pusher heaped an average of 1.2 cu yd extra into all scrapers tested. (See charts, at right.) A competing manufacturer substantiated these same figures!

Here's conclusive proof that no matter what scraper the TD-24 pushes, you load more in any given time... and that the "75" Payscraper carries more, no matter what pushes it! And that the TD-24 and "75" Payscraper, teamed together, out-produce other equipment combinations with faster loading, bigger loads, and all-around faster cycles.

Prove the stand-out pushing, loading, and cycle-speeding performance of the International TD-24 tractor and "75" Payscraper on your own jobs. Ask your International Construction Equipment Distributor for a demonstration!

Clipboard in Hand, equipment engineer signals "75" to begin controlled one-minute push-loading from TD-24 torque converter tractor. Although TD-24 push-packed an average 1.2 cu yd more in all scrapers, it loaded 2.1 cu yd more in "75" Payscraper, than competing pusher!





New pipe coupling makes tough, flexible joint

■ A new method of permanently jointing clay sewer pipe that is said to insure a watertight, root-resistant,

flexible union is announced by the W. S. Dickey Clay Mfg. Co. The Dickey PVC (polyvinyl chloride) coupling consists of rings, precision molded and fused on the spigot and in the bell of the pipe. The polyvinyl chloride is applied to hot pipe in liquid form and is cured at high temperatures.

To assure uniformity in the new coupling, it is put on the pipe at the factory by the manufacturers. A joint is made by applying Dickey lubricant sealer to the mating surfaces of the coupling and pushing the spigot firmly into the bell socket. This can be done using a shovel as a lever.

The Dickey PVC is a compression-type joint. It keeps the surfaces in tight contact with each other and exerts a pressure on the inside of the bell and the outside of the spigot, increasing the bond of the coupling with the pipe, the manufacturer reports.

For further information write to the W. S. Dickey Clay Mfg. Co., P. O. Box 2028, Kansas City 42, Mo., or use the Request Card at page 18. Circle No. 112.

Get your copy of Road Show Daily during the ARBA Road Show to keep up with events at the convention.



Nail holes on 1-inch centers permit nailing at almost any point on the Universal steel construction stake.

Steel construction stake suitable for re-use

■ A steel construction stake with a short, sharp point is announced by the Universal Form Clamp Co. Constructed of 3/4-inch round cold-rolled bar stock, the stake can be re-used, the manufacturer reports.

The stake is reported to give positive and accurate anchoring in any soil or subgrade condition and to cause less soil displacement. Nailing holes are on 1-inch centers, permitting nailing at almost any point.

The Universal construction stake is available in 2, 2½, and 3-foot lengths. Other sizes are available on order to meet specific requirements. The stake is recommended for use in footings, curbs, gutters, bracing, and screeding.

For further information write to the Universal Form Clamp Co., 1238 N. Kostner Ave., Chicago 51, Ill., or use the Request Card at page 18. Circle No. 34.

Air-activated containers

■ Air-activated containers for handling bulk materials are described in a catalog from the L. C. L. Corp. According to the catalog, the containers handle free-flowing granular materials such as cement and use an air compressor as the only piece of unloading equipment. With slight modifications, liquids may also be handled. The specification listing states that the standard steel container has an over-all height of 9 feet 7½ inches, a 7½-foot diameter, and a 258-cubic-foot capacity.

To obtain the catalog write to the L. C. L. Corp., 230 Park Ave., New York 17, N. Y., or use the Request Card at page 18. Circle No. 17.

Portable field offices

■ Contractors' portable field offices are described in a mailing piece from Mobile Office, Inc. The trailers, each equipped with a heater, two desks, a drawing table, and a blueprint rack, measure 8 feet wide and 25, 30, 34, or 39 feet long. The tandem-axle trailer has a painted aluminum exterior and spun glass insulation. A floor plan of the trailer is included in the mailing piece.

To obtain the mailing piece write to Mobile Office, Inc., 7300 Stony Island Ave., Chicago 49, Ill., or use the Request Card at page 18. Circle No. 20.

—For more facts, circle No. 294



Pushes 1.2 extra yds. into all scrapers!

PAYLOAD TESTS (average)

CYCLE TIME TESTS (average)

Pusher	International "75" Payscraper	Scraper "A"	Scraper "B"
International TD-24 Torque Converter tractor	20.6 cu. yd.	18.2 cu. yd. "75" bonus 2.4 cu. yd.	17.5 cu. yd. "75" bonus 3.1 cu. yd.
Pusher "A"	18.5 cu. yd.	17.0 cu. yd. "75" bonus 1.5 cu. yd.	17.1 cu. yd. "75" bonus 1.4 cu. yd.

International "75" Payscraper	4.8 min.
Scraper "A"	5.7 min.
Scraper "B"	5.6 min.

"75" Payscraper Proves 15% faster ... delivers up to 19 extra loads per 10-hour day

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INTERNATIONAL Construction Equipment

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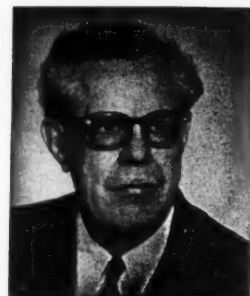
By listing the various steps in an assembly or work cycle, then analyzing these operations, it is a simple matter to arrive at a compilation of unit costs and composite unit costs. It is always best, if possible, to break down an estimate so that each step may be isolated and estimated properly. This procedure is less confusing for the estimator, and the results obtained with it are more accurate.

It is, of course, impossible to specify any one method of doing a job since site conditions and problems will vary

The engineering department—

Estimating for demolition, land clearing, pile driving

by **GEORGE E. DEATHERAGE, P. E.**
construction consultant



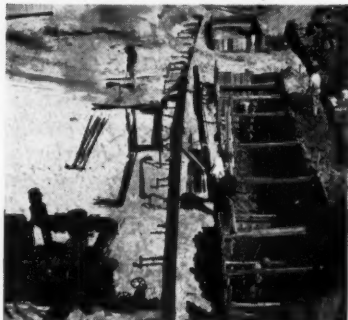
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from project to project. The same general rule holds true for estimating any particular job. Since this is true, the best that can be done is to point the way for estimators, attempt to show where dangers lie, and make suggestions as to design, methods, and procedures.

Wrecking and demolition

Frequently, a job site has to be cleared before work can start on a new project. This may involve wrecking and demolition, or it may simply involve land clearing. In any case, the primary object is to make the area ready for new construction.

If wrecking and demolition has to be done, it is always a good practice to secure subbids on this work from concerns specializing in the business. They have experienced personnel for the job and, a great many times, the value of the salvage is great enough so that the wrecker will pay a premium, over and above the wrecking cost, to secure the materials. This is particularly true if frame buildings are to be torn down.

If a contracting firm plans on wrecking buildings with its own

forces, it is common to estimate that the salvage will pay for the wrecking cost, providing that there is not a great deal of masonry or concrete to remove.

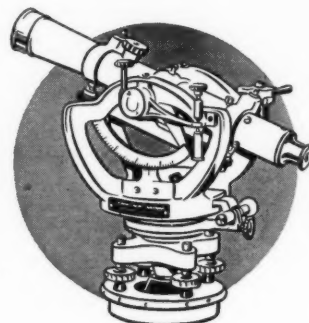
The only safe estimating practice is to make a rough estimate of the materials to be removed—computing masonry, concrete, and paving in cubic yards and lumber in thousand board-feet—then calculate a unit labor price for demolition and disposal.

If a building is to be demolished, it may be possible to use the fine debris to fill up the basement area or any low places on the site. This plan should be understood by the wrecking subcontractor, for invariably the wrecker will dump unwanted materials into the basement or on the site, leaving the clean-up job to someone else. The subcontract should stipulate just what can be left on the site.

Another good argument for subcontracting this work is that Workmen's Compensation rates are very high for demolition, and estimates must be prepared accordingly. If the work is sublet to wreckers who have the special insurances to cover the job, the contractor should make sure that



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This is the twelfth of a series of articles on Construction Management by George E. Deatherage, P.E., construction consultant. The articles are based on an eight-volume "Manual of Advanced Construction Management" published by Geo. E. Deatherage & Son, P. O. Box 921, Lakeworth, Fla. The manual is used in a training course for superintendents and project managers, and is directed primarily at those contractor employees who have reached the foreman level or its equivalent, and who need practical help in order to take complete charge of construction projects themselves.

these insurances are in effect before work starts.

In most metropolitan areas, a special permit will have to be secured for demolition, and definite types of protection will have to be provided for the public and for adjoining property owners. In Baltimore, for instance, owners of adjacent property may require the contractor to post bond protecting the adjoining property from damage. In such a case, the bond premium will have to be added to the estimated cost for this work. Most cities require special permits to be secured before work is started. All wrecking subcontracts should carry the clause that the work shall be done in accordance with governing laws and ordinances.

By wrecking foundations below grade, the contractor may achieve lower costs on this phase of the project, but he then may be faced with shoring and underpinning problems that will more than offset the amount of money saved.

Relocating utilities

The work of removing, replacing, or relocating hydrants is almost invariably done by water companies, from which prices, or at least estimates of the cost, can be obtained. The local building code or the state code will dictate the procedure to use. Estimates for removing, relocating, or replacing telephone or telegraph poles will have to be secured from the utility company owning the poles. Early action is advisable in cases like this, for the job of securing prices for the work is usually a long, drawn-out process that may take several weeks.

Taking care of the sewers and drains on a property before construction is started is usually the work of the plumbing subcontractor, but specifications should be checked because, if this is not the case, a separate provision will have to be made for this work in the general estimate. Provisions must be made to protect the adjoining property at all times. Sewers on such property must be kept in service, and the property itself must be protected from outflow drainage during construction operations. A check of the building code will reveal whether or not water from excavations may be allowed to be carried away in sanitary sewers.

A contractor on highway construction will make adequate drainage his

first consideration during excavation work. Almost any material will provide a fairly good road and working surface if it is kept free from standing water. All subcontracts on a job like this should require the subcontractors to take care of surface water during the operations and to protect adjoining properties.

Land clearing

Land clearing is usually priced on a per-acre basis, the cost varying with the number of large trees and whether or not the stumps have to be removed. All prices are based on the assumption that a bulldozer can be used for the work and debris burned on the site. It is a good practice to take subcontract prices from specialists in this work. If the contracting

firm wants to handle the job, it is a good idea to inquire about equipment that can be do the work speedily and at a reduced cost. Catalogs and performance data on any equipment may be had from the manufacturer.

Trench shoring

Subsoil conditions will dictate when shoring and sheet piling are needed in an excavation, the nature of the ground, the amount of water present, and the depth of the excavation being the determining factors. No general rule can be made for all conditions, but a good rule of thumb is that narrow trench or pier excavation should not be carried down more than 5 feet without bracing to guard workmen against cave-ins.

If trenches are dug more than 5



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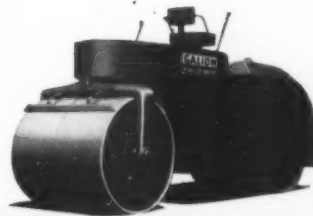
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management

feet deep in hard, compact soils, it is usual to brace the trench with vertical planks, not less than 2x8 inches in size, and spaced not more than 8 feet apart. Horizontal rangers or walers can then be set lengthwise and braced from side to side with either sewer jacks or wood braces. If the trench is 1 to 3 feet wide, a 4x4 brace will provide enough safety against cave-ins. A 4x6 brace is adequate for a trench 3 to 6 feet wide, and a 6x6 brace will safely hold against a 6 to 8-foot wide trench. Should the ground be of such a nature that sheathing is required, from 3 to 3½ feet of lumber will be required per square foot of wall. Care should be taken to design sheathing and bracing to meet safely require-

ments if a trench goes more than 8 feet deep.

In figuring support for trench walls, the estimator will have to build up a composite unit price that includes the cost of piling less salvage, cartage, handling and driving, air compressor labor and rental, hammer rental, and such things as the cost of pulling the piling and the cost of its cartage, storage, or credit for return or re-sale.

Several proposed methods of trenching may be set down, step by step, by means of process charts, then analyzed to discover the cheapest and most effective way of doing the job. It is a simple matter to calculate the quantities and figure the cost in each step. The total cost of each step can then be subjected to analysis.

This may reveal that open-cut trenching with sloped banks will eliminate the use of shoring or sheet

piling, and make the entire job less costly even though additional earth is handled as backfill.

Basement sheet piling

If wood is used to brace basement walls 8 to 16 feet deep, or deeper, from 6 to 7½ board-feet of lumber will be required per square foot of wall and will have to be provided for in the estimate. This figure includes bracing but makes no allowance for surcharge due to adjacent buildings or street loads. Some slight movement can be expected when wood is used for sheeting or shoring, and, if adjacent streets, buildings, and other structures are to be protected from cracks, a heavy steel sheet piling should be driven ahead of the excavation to a point 4 or 5 feet below the bottom of the excavation line.

Unit costs are usually compiled in

dollars per square foot of wall shored or sheeted. This cost will have to be compiled by listing the labor and materials in each successive step of work, pricing them individually, then dividing the total cost by the square foot of wall. If the material is to be pulled and used again and again, allowance can be made for the re-uses.

One expensive item, which should be held to a minimum, is form boxes placed around all bracing that passes through the exterior walls of poured concrete in basement areas. The cost of these should always be taken into account by the estimator.

The type and grade of lumber used for sheeting can have an important effect on the estimate. In all cases, rough and undressed lumber is stronger and more economical for this work. Oak and other hardwoods will take more driving abuse and can be used more often, but these are heavier to handle and harder to work. If the contractor elects to use pine, it should be better than the ordinary No. 2 common, which has many large knots and is apt to have other imperfections. Fir is more free of knots and its cost is not much greater than pine. A comprehensive volume that will help in striking a good balance between cost and service for this material is "Wood Structural Design Data", which is published by the National Lumber Manufacturers Association, Washington, D. C. This volume is so tabulated that lumber sizes can be selected for any load and span and the recommendation found easily.

Bridge pier sheeting, shoring

Where bridge pier excavation is to be done in the dry, the bracing job can be handled in much the same manner as for basement walls. But if ground conditions are bad or water is present in any sizable amount, it will be necessary to drive heavy steel sheet piling ahead of the excavation.

Most piling is secured today on a rental basis of a definite price per ton, and credit is given at a specified rate for all piling returned in usable condition. Because of this, piling that is bent should be straightened before being returned, damaged ends should be cut off square with a torch, and the metal cleaned and greased. Failure to do this will result in a penalty assessment being made for damage. Standard rental agreements for this item can be secured from renting firms.

Before billing materials, including sheet piling, a plan should be made with sections showing each row of rangers and the bracing so that the correct number of piles can be selected for the job, together with specials like right and left-hand corners and tee sections. Allow for these special pieces in the estimate. Items of miscellaneous iron, such as rods to tie walers and bracing together to prevent any movement during driving operations, will also have to be figured.

The skid-type pile driver is rarely used today, except on very large jobs, hanging leads handled by a crane providing a cheaper and more mobile method of driving piling. Power for



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the hammer is supplied by an air compressor or a flash-type steam boiler designed for this purpose.

In estimating the cost of driving piling with such a rig, the estimator will compile a price per square foot of wall. This price will include such things as the steel piling—minus allowance for salvage—transportation and cartage, loading and unloading, cleanup and loss on damaged piling, equipment setup and dismantling, cartage on equipment, miscellaneous iron, timber for rangers and backing, and labor for driving and pulling. A gang chart, (see "Process Charts and Gang Process Charts", C&E, November, 1956, pg. 140) will be useful in making the operation most economical for both material and labor.

The biggest difference in estimating jobs involving the driving of sheet piling in the dry and those involving the driving of sheet piling for cofferdams is that floating equipment is usually required for the latter work. The same process of setting down the procedure to be used on the job, step by step, then measuring and pricing the labor and materials required, is also followed on this type of work. This marine work and its estimating are specialties that are best left to a subcontractor unless the general contractor is well equipped to handle the job. Usually, it is better if the contractor depends on subcontract prices from firms that do this work on a regular basis.

Wood bearing piles

The driving of wood bearing piles is also a specialty that is better handled by subcontractors. It is general practice to figure these piles per linear foot in place. Material prices will vary with the type of wood, the diameter of the pile at the butt and tip, whether or not they are of treated lumber, the cartage expense, and the number of piles to be driven.

If the work is subcontracted, the estimator's main concern is only with the piling material specifications, the number of piles to be driven, and the length of the piles. If the job is not subcontracted, all the steps involved in getting the piling into place will have to be set down by the estimator, who can then prepare material and labor prices for each step.

The estimator should also keep in mind that his estimate might have to cover the expense of an inspector to check the penetration and bearing value of each pile driven. On large jobs, the engineer/architect usually provides the service.

Other piles

Steel bearing piles may consist of steel H sections; pipe piles, which may or may not be filled with concrete after they have been driven; and the cold-rolled, fluted Monotube piles. No approximate price can be given on installations using these piles; in each case, the estimator will have to build up the composite price from the plan of each job. Information on steel bearing piles can be obtained from the manufacturers, and it is a good practice for the potential superintendent or project manager to keep

current catalogs on file.

Concrete bearing piles may either be precast or cast-in-place, and unless the general contractor is equipped to handle a job with either of these methods, it is usual to subcontract this phase of a job. Some firms, like the Raymond Concrete Pile Co., or McArthur Concrete Pile Co., both of New York, N. Y., will make a preliminary examination and conduct tests on the site, then quote a price per pile in place to the required bearing value.

Drilled-in-place piles or foundations have developed rapidly in the last few years. In this operation, holes are drilled to bearing with special machines and then filled with concrete. The holes may be belled out at the bottom to provide a larger bearing area. Where the ground permits, the

piles may be unlined or uncased. In wet or bad ground, the casing may consist of a light metal that is put down as drilling proceeds. Prices for this type of pile foundation can be secured from the subcontractors specializing in this work.

(Next month's article will deal with "The engineering department — excavation and haulage".)

Clay-pipe jointing

■ Five tested methods for jointing vitrified clay pipe are described in a new bulletin from the Clay Sewer Pipe Association of Columbus, Ohio. The bulletin gives instructions for jointing hot-poured bituminous joints, Wedge-Lock joints, pre-cast bituminous joints, mortar joints, and pressure joints. Information on preparing

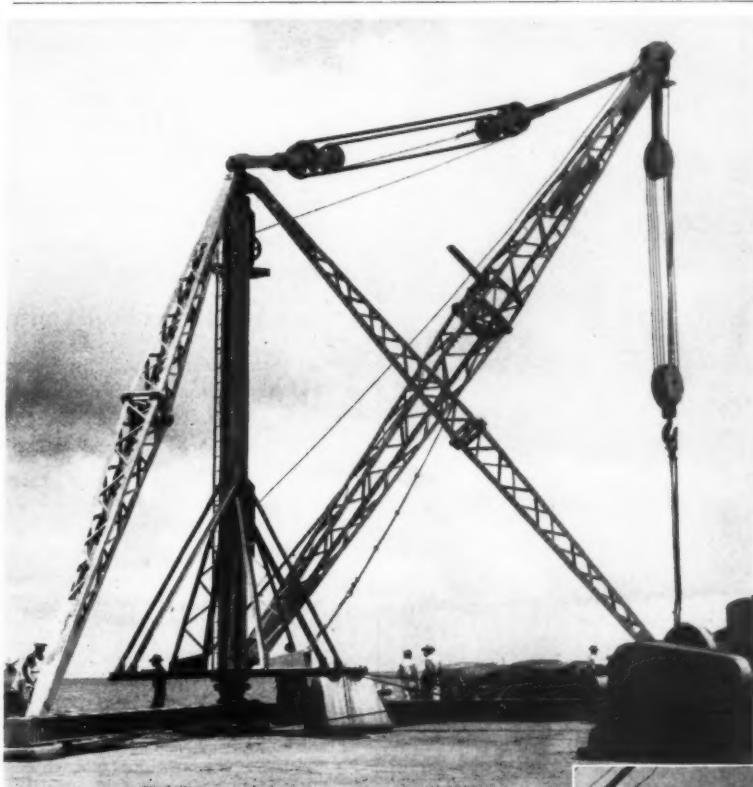
trench beds and backfilling also is included.

To obtain this bulletin write to the Clay Sewer Pipe Association, 311 High-Long Bldg., 5 E. Long St., Columbus 15, Ohio, or use the Request Card that is bound in at page 18. Circle No. 92.

Rust Engineering news

The M. K. Griggs Co., Inc., Houston, Texas, will serve as the Texas representative of the Rust Engineering Co. construction firm of Pittsburgh, Pa. Griggs will handle the eastern half of Texas.

President of the Houston firm is Mark K. Griggs; vice president, Burton W. Wallin; and sales engineer, James H. Lyman.



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Pride of Guatemala's new Atlantic seaport of Santo Tomas is this new Clyde steel derrick operated by a Clyde gasoline hoist. Citizens of Santo Tomas turned out en masse for recent dedication ceremonies to watch the Clyde unit load the first ship with sacked zinc and lead ore for shipment to the United States.

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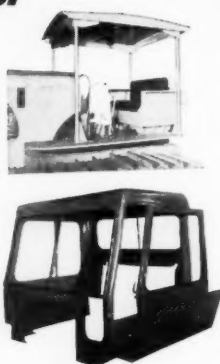


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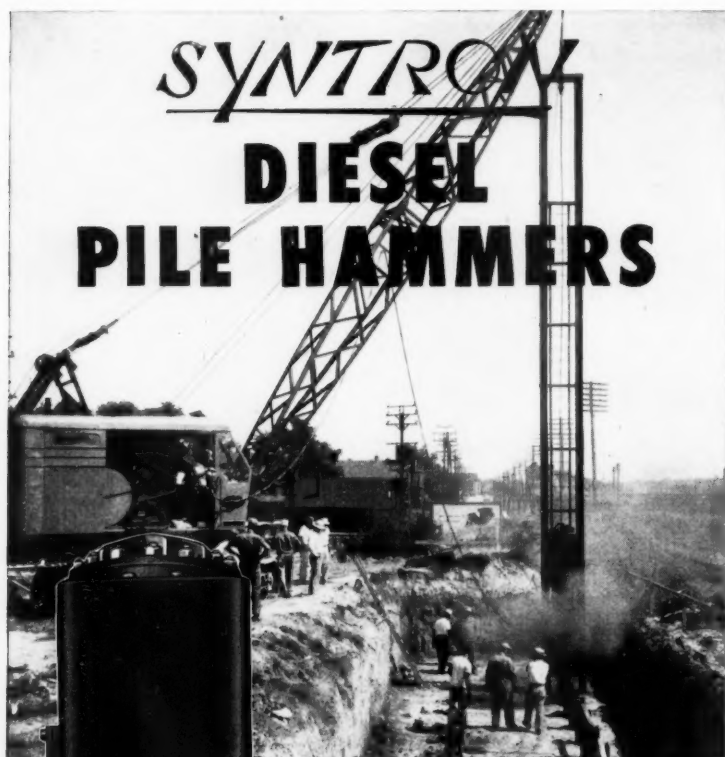
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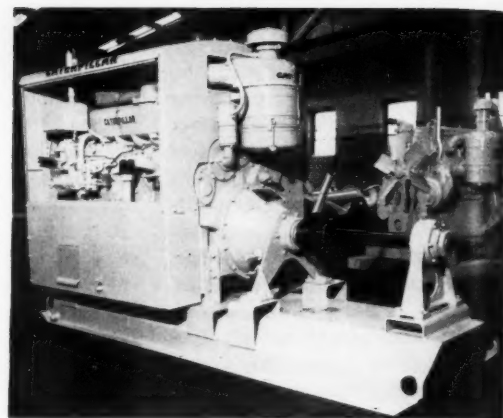
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The new "wrap-around" engine base announced for Cat diesel engines and electric sets features greater fuel capacity, lighter weight, and sturdier construction.



New type fuel-tank base has increased capacity

■ A new type of "wrap-around" base and fuel-tank combination for use with Caterpillar diesel power units and electric sets has been announced by the company. The new base can be used with all Cat engines and electric sets from the D311 through the D342.

Extended and short-base models for D337 (Series F) and D326 (Series F) engines, a short-base model for the D318 engine, and electric set models for the D311 and D315 are presently available.

The wrap-around base replaces the steel channel base formerly used. The new design features greater fuel capacity, lighter weight, and more rigid construction. The primary advantage is the ability of the new base to withstand the stress and strains of skidding and dragging, the company points out.

For further information write to the Caterpillar Tractor Co., Peoria, Ill., or use the Request Card at page 18. Circle No. 115.

Torque-converter fluid controls seal shrinkage

■ Seal shrinkage and hardening are said to be eliminated when a new torque-converter fluid, developed by D-A Lubricant Co., Inc., is used. The fluid reportedly also reduces varnish deposits to an absolute minimum and controls seal swelling.

Designated Type C torque fluid, it is recommended by the company for use on all models of the Allison Torque-matic transmissions and retarders.

The fluid contains a new lubricating oil additive that decreases seal swelling to less than 0.2 per cent, the manufacturer reports. This is compared to ordinary paraffinic oils, which

cause seal shrinkage up to 5 per cent, and naphthenic oils, which cause seal swelling up to 5 per cent.

A high-temperature oxidation inhibitor is said to almost completely eliminate sludge and varnish deposits on all moving parts of the torque converter, even at the highest permissible operating temperatures. The pour point of the Type C fluid is minus 35 degrees F.

For further information write to D-A Lubricants Co., Inc., 1331 W. 29th St., Indianapolis, Ind., or use the Request Card at page 18. Circle No. 104.



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CONTRACTORS AND ENGINEERS

By raising the new Lufkin frameless dump trailer on the single hydraulic ram, the wheelbase is automatically shortened, making maneuvering in tight spaces easier.



Frameless dump trailer hoists with single ram

■ Hoisting with a single ram from the fifth wheel is the new hydraulic Headlift trailer, a frameless dump unit manufactured by the Lufkin Trailer Division of the Lufkin Foundry & Machine Co. The trailer can be used behind any tractor with either a semiautomatic or permanent-type fifth wheel.

There are five different hoists to select from each of which maintains a constant hoisting pressure to assure an evenly lifted load. A safety device halts the lift mechanism if the trailer is overloaded.

The Headlift trailer is available in single and tandem-axle models with

capacities ranging from 10 to 24 cubic yards. The hoist folds into the trailer, allowing the trailer to ride on a conventional fifth wheel.

By manipulating the trailer and tractor brakes and by raising and lowering the trailer, the operator can maneuver out of muddy or slippery areas and out of holes or ruts. With the trailer hoisted, the wheelbase is shortened for easier maneuvering in tight areas.

For further information write to the Lufkin Trailer Division, Lufkin Foundry & Machine Co., Lufkin, Texas, or use the Request Card at page 18. Circle No. 101.

Welding torch operates on LP gas or acetylene

■ A welding torch that will operate either on LP gas or acetylene is announced by Weldit, Inc. The two-in-one Weldit B56 torch requires only a change of tips to transform it from one type of fuel to another.

The torch features a heavy-duty

brass handle that is said to be more durable than wood or other materials. The handle is insulated with formica.

For further information write to Weldit, Inc., 988 Oakman Blvd., Detroit 38, Mich., or use the Request Card at page 18. Circle No. 35.

Portable power plant operates continuously

■ A portable engine-generator unit that is designed to produce 12,000 watts continuously, 24 hours per day, is announced by Witte Engine Works, Oil Well Supply Division, United States Steel Corp. Model 100 RDA consists of a heavy-duty, industrial-type generator direct-connected to an 18-hp water-cooled diesel engine.

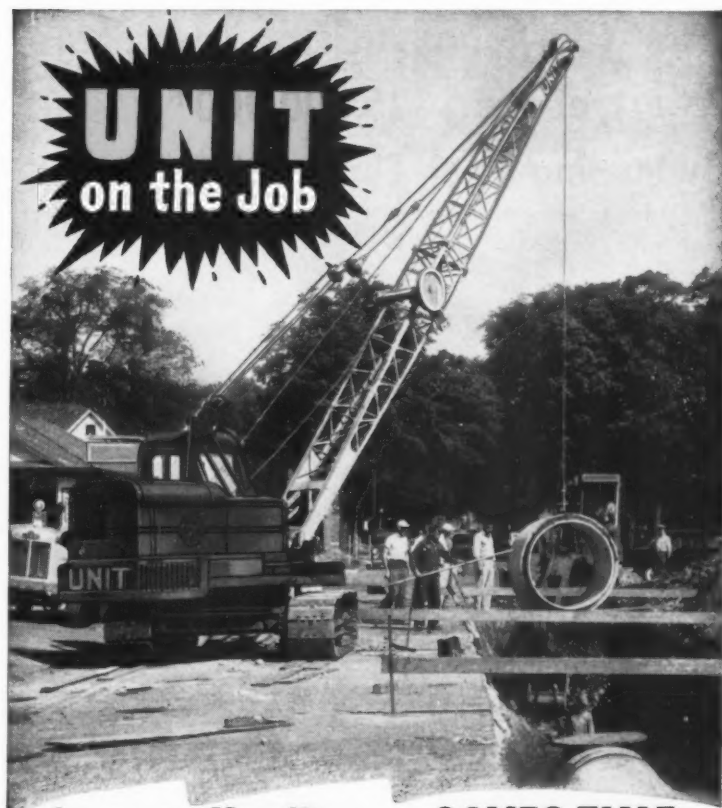
The engine is designed with two horizontally-opposed cylinders. Because of this arrangement it is only 30 inches high. It weighs 1,700 pounds and occupies a 65x39-inch floor space.

The engine is a Witte Model 100 with a 100.5-cubic-inch displacement. It has a 4-inch bore and a 4-inch stroke and operates the generator at



1,800 rpm. The standard generator is a 3-phase, 60-cycle unit, inherently regulated and complete with direct-connected exciter.

For further information write to the Witte Engine Works, Oil Well Supply Division, U. S. Steel Corp., 1614 Oakland Ave., Kansas City, Mo., or use the Request Card at page 18. Circle No. 56.



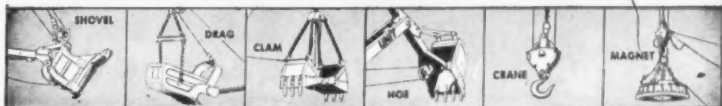
Accurate Handling... SAVES TIME

This sturdy UNIT Crawler Crane offers plenty of power plus accurate control. Spots heavy sewer pipe perfectly into the desired position. Adjustable Hook Rollers, Extra Long Crawlers and Wide Multiple Hinged Crawler Shoes provide all-around stability. Full Circle Swing, controlled from within UNIT'S FULL VISION CAB, provides safe and efficient operation. The operator has a complete view of the entire job at all times. GET THE FACTS! Investigate this modern UNIT and its many features. Write today for literature.

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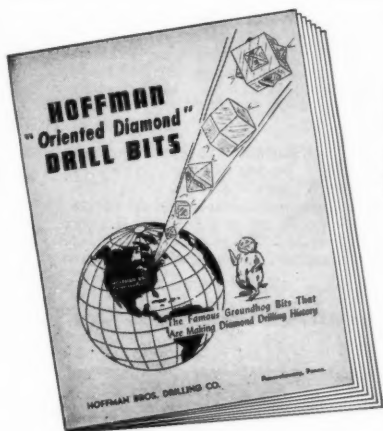


**1/2 or 3/4 YARD EXCAVATORS... CRANES UP TO 20 TONS CAPACITY
CRAWLER OR MOBILE MODELS... GASOLINE OR DIESEL**



All Models Convertible to ALL Attachments!

For more facts, use Reader-Reply Card opposite page 18 and circle No. 305



Find Out How HOFFMAN BITS Save You Money

Send for a copy of
HOFFMAN'S new
"Oriented Diamond"
Drill Bit Catalogue



See how Hoffman Research is producing many other, almost unbelievable advancements in bit design like the Tapered "Step Core" and Miniature Bits shown here. The new Miniature Bits are reducing prospecting labor and costs because they operate from light, 1/4 h.p. rigs. By combining drilling and reaming into one operation, the "Step Core" Bits penetrate faster—simplify core recovery—have high speed water release. Yes, it will pay you to find out why so many other drillers are getting better cores, lower footage costs and faster penetration with Hoffman "Oriented Diamond" Bits.

Hoffman Drilling Crews are also available for fast, efficient service on Contract Drilling Jobs.



HOFFMAN BROS. DRILLING CO.
BOX 426, PUNXSUTAWNEY, PA.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 304

Road Show preparations near completion

With nearly 300 manufacturers of construction machinery and materials signed to exhibit their newest products, plans for the big ARBA Road Show next January are going ahead under full of steam.

The mammoth show is scheduled to open January 28 in Chicago's International Amphitheatre, and will run through February 2. It is expected to

be the largest industrial exposition ever assembled under one roof.

Officials of the Construction Industry Manufacturers Association—the manufacturers' division of ARBA—estimate that upwards of 25,000 persons will visit the show, being held in conjunction with the annual convention of the American Roadbuilders' Association.

Are You Ready to Get Your Share of the \$325,000,000* Swimming Pool Construction Market?



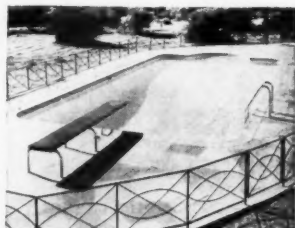
*Survey by Swimming Pool Age

AIRPLACO Concrete Gunning Equipment Makes Pool Construction

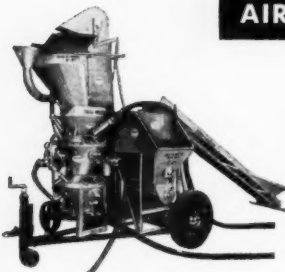
FASTER • EASIER • MORE PROFITABLE

As the swimming pool becomes an increasingly familiar part of America's way of living, it opens up a tremendous new profit opportunity for you.

This opportunity can be even more profitable if you use AIRPLACO concrete gunning equipment for your pool construction jobs. You get the job done faster, easier, better and at a greater profit to you.



AIRPLACO PORTABLE RIG



The AIRPLACO rig consists of a job-proved BONDATOR® or NUCRETOR®, the automatic proportioning, continuous mixing, elevating and screening MIX-ELVATOR, and the time-saving SAND-LOADER. Makes any concrete job easier, more profitable.

AIRPLACO concrete gunning equipment is available in a wide range of sizes to meet your production and job requirements from 1/2 to 7 cubic yards of aggregate per hour, and using air compressors with 75 to 600 CFM capacity.

FREE CATALOG

WRITE TODAY FOR FREE CATALOG... that will explain all the many benefits and specifications of AIRPLACO concrete gunning equipment or see your AIRPLACO distributor.



AIR PLACEMENT EQUIPMENT CO.

1007 WEST 24TH ST. • KANSAS CITY 8, MO.

MANUFACTURERS OF ADVANCED DESIGN CONCRETE GUNNING, MIXING AND PUMPING EQUIPMENT

For more facts, use Reader-Reply Card opposite page 18 and circle No. 306

To roadbuilders, the upcoming Road Show will be the biggest industry event of the year. Next year is the first year of the new national highway program in which the federal government will contribute \$25 billion toward construction of a 41,000-mile Interstate System of super-highways. On the verge of the highway boom, contractors and highway officials are most interested in building up their fleets of equipment. The purpose of the Road Show is to assemble as many different kinds of machinery in one spot as possible for the inspection of these equipment users.

"It has been nine years since the last Road Show, and there have been tremendous improvements in road-building machines," ARBA's executive vice president, Gen. Louis A. Prentiss, said in announcing further plans for the Show. "Equipment designers have come up with devices that are twice as powerful and larger and faster than we imagined possible even a decade ago."

"The 1957 Road Show will certainly dramatize these advances. It will be a real 'Pageant of Progress in Construction Machinery.'"

More than 1,500 visitors from at least 50 different foreign countries are expected to attend the Show. Show managers are going to great

lengths to make the visit pleasant for these delegates and the thousands of American roadbuilders who will attend. Comfortable reception lounges, a complete telephone center with extensions to each booth, and refreshment stands will be built in the Amphitheatre. There will be a complete press center for the 200 editors, writers, and newsreel, radio and television reporters who will cover the Show.

In addition to ranking as the largest indoor industrial show ever to be staged in America, the 1957 Road Show will be the most completely decorated such exposition. Designers are working on plans for colorful 27-foot sidewalls and curtains in a blue-and-gold color scheme. The entire ceiling of the mammoth central hall will be laid out in a blue and gold block pattern. The Show's planners will spend more than \$100,000 to decorate the Amphitheatre. The job will require 1,000 carpenters, electricians, and other stage men.

During the Show itself, between 1,500 and 1,700 manufacturers' representatives will be on hand to demonstrate or explain their companies' products. Thirty special buses will shuttle visitors on a continuous schedule between the convention hotels in downtown Chicago and the Amphitheatre.

The ARBA convention will feature

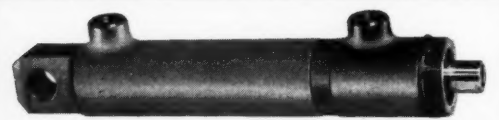
B. H. E. W. Custom-Built HYDRAULIC CYLINDERS

Longer Life, Better Performance for Materials Handling Equipment

- Honed steel cylinder.
- Full double-sealing "U" cup packing.

BHEW custom-built hydraulic cylinders give dependable operational performance wherever they are used. These efficient, close-tolerance cylinders require minimum mounting space; their cost is reasonable; there is no charge for tooling. BHEW builds cylinders to meet your specifications, delivers them on schedule.

BHEW CYLINDER FEATURES: • Standard and special designs available. • Double or single acting and telescopic. • 1 1/2" to 8" bore. • Strokes up to 156". • Smallest possible O. D. and retracted O. A. length. • Oil cylinders with 1,500 psi or 3,000 psi working pressure, pneumatic up to 150 psi. • Cup-type, ring-type or O-ring construction. • Choice of mounting.



Furnished in a wide variety of mountings and anchor brackets.

Send us specifications of your requirements, for full information.

Our engineers will be happy to work with you on any cylinder problems you may have. Without charge, of course.



Benton Harbor Engineering Works, Inc.

622 Langley Avenue

St. Joseph, Michigan

For more facts, use Reader-Reply Card opposite page 18 and circle No. 307

CONTRACTORS AND ENGINEERS

national leaders as speakers and numerous technical sessions for highway engineers.

But the big attraction will be the Show itself—thousands of pieces of construction machinery at their brand-new best. Towering cranes, gigantic shovels, powerful tractors, large pavers, sturdy crushing plants, and huge scrapers will be the most obvious units, but the range of tools on display will include everything used in highway building. THE END

Attachments fit tractor with slight modification

■ The Davis Model 102 loader and the Model 185 backhoe have been adapted to fit the John Deere 420 C crawler tractor, according to the manufacturer of the attachments, Mid-Western Industries, Inc. The adaptations primarily involve the use of a heavier subframe.

The standard loader bucket has a capacity of 11 cubic feet; the utility bucket has a capacity of ½ cubic yard. The loader and backhoe utilize the same hydraulic system, which is powered by an independent direct crankshaft drive. A special selector valve permits the operator to have immediate use of either attachment.

The Davis backhoe will operate at right angles to the tractor as well as to the rear. It can be attached or detached from the rig in less than five minutes, the manufacturer reports. A full range of backhoe buckets is available.

For further information write to Mid-Western Industries, Inc., 1009 S. West St., Wichita, Kans., or use the Request Card at page 18. Circle No. 113.

Rust prevention

■ How to solve rust problems with Valvoline Tectyl rust preventives is answered in a booklet from the Valvoline Oil Co. The problem of rust, cleaning the product, materials in corrosion preventives, and choosing a rust preventive are some of the topics analyzed. Comparison charts contain information on the nature of coating, film thickness in inches, approximate square foot coverage per gallon or pound, approximate drying time, application method and temperature, and the suggested method of removal.

To obtain the booklet write to the Valvoline Oil Co., Freedom, Pa., or use the Request Card at page 18. Circle No. 29.

Diamond blades explained

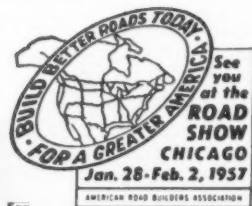
■ The terms and names used in the manufacture of diamond blades are explained in a pamphlet from the Clipper Mfg. Co. Black diamonds and secondary abrasives are fully explained. The terms "metal bonds", "grit sizes", "steel centers", and "diamond concentration" are also defined and discussed.

To obtain Pamphlet 1013 write to the Clipper Mfg. Co., Suite 635, 2800 Warwick, Kansas City, Mo., or use the Request Card at page 18. Circle No. 95.

WORKMEN PUT THE FINISHING TOUCHES on what is reported to be the largest heavy-duty concrete prestressing bed in Florida. The lay-out is owned by Prestressed Concrete, Inc., a franchised yard of Leap Concrete, Inc., designer of prestressing facilities and products. The prestressing bed is 422 feet long and the abutments at each end will resist a total horizontal thrust of more than two million pounds. Each abutment is 31½ feet long and 18 feet wide, and each contains 135 cubic yards of concrete and 6 tons of reinforcing steel. The lay-out is reported to be capable of turning out prestressed concrete beams covering a clear span of up to 125 feet. Any type of bridge member, building beam, pile, double T section, or column can be produced. For more details on the prestressing facilities circle No. 31 on the Request Card at page 18, or write to Leap Concrete, Inc., Lakeland, Fla.



THIS TOO, IS JOB INSURANCE!



See Hyster Equipment at the Caterpillar Tractor Co. Display



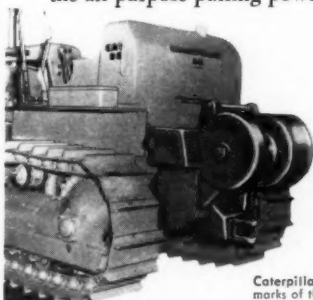
A HYSTER TOWING WINCH ON MY CATERPILLAR-BUILT TRACTOR PROTECTS ME AGAINST... LOSS OF { TIME PRODUCTION PROFITS

● Naturally, I insure myself against all possible losses on all of my contracts. But I consider the price of my Hyster Winch the cheapest insurance premium I've ever paid.

Here's Why: Profits slide down fast when bogged-down equipment causes lost time and production. I cut this loss to a minimum by keeping the job moving with the all-purpose pulling power my Winch provides. At

the same time I am reducing wear and tear on my tractor because the Winch is designed specifically for heavy pulls greater than the tractor drawbar pull.

Thousands of tractor owners have found that the Job Insurance provided by Winch-pulling power pays big dividends. For all the facts, call your Caterpillar Dealer (he is also your Hyster Dealer) or write Hyster Company, 2952 N. E. Clackamas St., Portland, Oregon, or 1852 N. Adams Street, Peoria, Illinois.



D8D TOWING WINCH

All Hyster Winches are designed for "balanced, matched performance" with Caterpillar-built Tractors. . . . When you operate a Caterpillar-Hyster "Machine Package" you know you are getting your money's worth.

Caterpillar and Cat are registered trademarks of the Caterpillar Tractor Co.

HYSTER COMPANY

A full line of Winches for Caterpillar-Built Tractors



For more facts, use Reader-Reply Card opposite page 18 and circle No. 308

Concrete-mix controls

■ A bulletin discussing the latest precision concrete control equipment and methods of the Scientific Concrete Service Corp. is available from the company. The literature also details the results which can be expected with the use of the equipment and methods, which are said to eliminate inaccuracies in tolerances and water control. The usual precision concrete control installation consists of the firm's new Auto-Hydro-Meter and three Toledo scales, all built to weigh to a tolerance of 0.10 per cent: a Moisture-Meter scale, a combined aggregate and water scale, and a cement scale. The latter two scales have automatic recording equipment.

To obtain this bulletin write to the

Scientific Concrete Service Corp., 724 Salem Ave., Elizabeth 3, N. J., or use the Request Card at page 18. Circle No. 108.

Motor trucks

■ Payhaulers, heavy-duty motor trucks manufactured by International Harvester, are described in a bulletin from the company. Model 65, an 18-ton-capacity unit, and Model 95, a 24-ton unit, are powered by turbo-charged diesel engines. The component parts of these rear-dump trucks and specifications are detailed.

To obtain Bulletin No. CR-495-F write to the International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill., or use the Request Card at page 18. Circle No. 13.



The Littleford Tankar steam heater can also be used to supply steam for cleaning equipment and small pile hammers.

Portable steam heater operates automatically

■ A steam heater that is completely automatic in operation is available from Littleford Bros., Inc. The portable Tankar heater will produce 200 pounds of steam pressure from a cold start in two minutes, according to the manufacturer.

The Tankar's automatic system stops and starts the burner, controls the pressure of the steam output, lights the burner by means of an electrical spark, feeds water into the coil, and shuts down the burner should the water supply from the pump fall below a safe minimum. A temperature-

limit control shuts the burner down if the steam becomes too hot.

In addition to being a source of steam for heating, the Tankar can be used to supply steam for cleaning purposes and to drive such steam-powered rigs as a small pile hammer. According to the manufacturer, the unit is capable of 75 per cent thermal efficiency.

For further information write to Littleford Bros., Inc., 485 E. Pearl St., Cincinnati 2, Ohio, or use the Request Card that is bound in at page 18. Circle No. 106.

Stabilized shoulders are subject of booklet

■ Stabilized aggregate shoulders for heavy-duty highways are described in a booklet from the Calcium Chloride Institute. According to the booklet, stabilized aggregate shoulders are safer, because the hazardous drop-off at the pavement edge is eliminated, and stability is maintained in all seasons. Included in the booklet are job

photos and specifications for new construction, maintenance procedures for stabilized aggregate shoulders, and established methods for its construction, reconstruction, and maintenance.

To obtain the booklet write to the Calcium Chloride Institute, 909 Ring Bldg., Washington 6, D. C., or use the Request Card at page 18. Circle No. 7.

Granco Steel Products promotes Eck, Schaefer

The Granco Steel Products Co. of St. Louis, Mo., has promoted Charles Eck to product manager for highway products in the firm's home office. Eck, formerly district sales manager in Kansas City, Mo., will be succeeded

in that post by Louis Schaefer.

Mr. Eck joined Granco in 1950 as a field engineer, and three years later was transferred to the Kansas City office. Mr. Schaefer had been a sales engineer in Kansas City.



MAYFIELD, Wash.—Workmen, held by safety ropes, drill away on a cloudy stone cliff high above roiling Cowlitz River to prepare abutment for Tacoma City Light's \$37,000,000 Mayfield Dam being built to bring needed electrical energy to the northwest Washington area.

**NO MATTER WHERE YOU GO—
If You See Hose, You'll See
PUNCH-LOK HOSE CLAMPS**

Write for Descriptive Literature or
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"The Sign of
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**PUNCH-LOK
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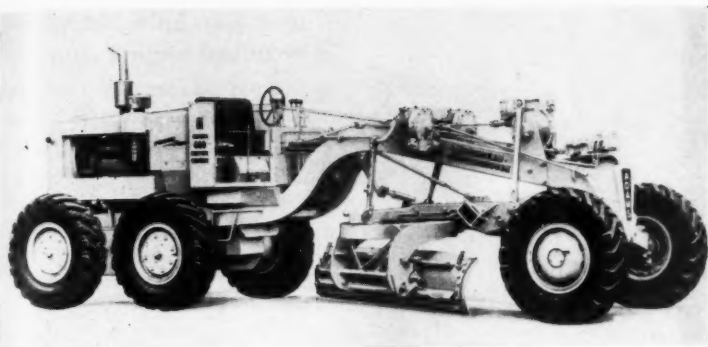
For more facts, use Reader-Reply Card opposite page 18 and circle No. 309

When You Judge and Choose a Construction Magazine— Consider All These Points Together . . .

1. **CIRCULATION** . . . For maximum value, a magazine must offer maximum coverage of the important groups that influence the purchase and preference for their advertisers' products and services.
Contractors do the buying and C & E delivers more contractors!
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C & E delivers more editorial and a higher ratio of editorial to advertising!
3. **FORMAT** . . . Size, and arrangement of both editorial and advertising layout, together with overall organization of contents must all be evaluated and analyzed when a magazine's worth, as an advertising medium, is being judged.
Only C & E helps the advertiser with reading matter above and beside every 7x10 ad and standard spread.
4. **ADVERTISING** . . . The number of advertisers, of exclusive advertisers and amount of advertising—these are important considerations.
More advertisers, more exclusive advertisers, more advertising in C & E.

Contractors and Engineers
Magazine of Modern Construction
470 Fourth Ave., New York, N. Y.

CONTRACTORS AND ENGINEERS



Torque-converter model of motor grader added

■ A torque-converter model of the Adams 660 motor grader is announced by the LeTourneau-Westinghouse Co. Designated as the Power-Flow 660, the unit has basically the same design as the standard model with the addition of a torque-converter drive train plus a 27 per cent increase in engine power.

The Power-Flow grader teams a 190-hp diesel engine with a single-stage torque converter and a four-range constant-mesh transmission. Said to triple available torque, this drive system provides the equivalent of an infinite number of gear ratios which adjust automatically to variations in load requirements, according to the manufacturer.

The torque converter and constant-mesh transmission combination provides four forward speed ranges from 0.23 mph to 27.4 mph. In reverse, there are an equal number of ranges from 0.22 mph to 24.4 mph. Engine options for the Power-Flow 660 are either the Cummins HRFB1 600 or the GM 6-71.

For further information write to the LeTourneau-Westinghouse Co., 2301 N. Adams St., Peoria, Ill., or use the Request Card at page 18. Circle No. 114.

Clutches, transmissions

■ A line of automatic clutches and transmissions are pictured and described in a bulletin from the Salisbury Corp. The clutches, for use in gasoline engines from $\frac{3}{4}$ to 25 horsepower, range in stock bore size from $\frac{1}{2}$ to $1\frac{1}{2}$ inches. The transmissions have a stock bore size from $\frac{5}{8}$ to $1\frac{1}{2}$ inches and are for gasoline engines from 1 to 20 horsepower.

To obtain Bulletin 56-D-1 write to the Salisbury Corp., 1161 E. Florence Ave., Los Angeles 1, Calif., or use the Request Card at page 18. Circle No. 23.

Concrete conveyor

■ A concrete conveyor for handling construction materials is detailed in a bulletin from the Viking Mfg. Co. According to the bulletin, the 36-foot-long conveyor consists of electro-galvanized steel sections, weighs 1,500 pounds, and operates on gasoline or electric power. Job photos show how the unit mounts on two 15-inch automobile tires.

To obtain the bulletin write to the Viking Mfg. Co., Manhattan, Kans., or use the Request Card at page 18. Circle No. 30.

A torque-converter model, the Power-Flow 660, has been added to the LeTourneau-Westinghouse line of Adams motor graders.

"It's the large economy size..."



Gandy



McKiernan-Terry Equipment helps to construct world's biggest basement

The 4-acre, 4-level basement for Denver's huge Court House Square development required piles driven around the entire perimeter of more than 1,750 feet and also for the drainage pump cofferdams.

Steel H-beams of various sizes and lengths were used, and the piles were driven by McKiernan-Terry 9B3 and 11B3 Double-Acting Pile Hammers. A McKiernan-Clayton Steam Generator was also used to power the larger hammer. The entire project was designed and supervised by the consulting engineering firm of Proctor, Mueser & Rutledge of New York, the work was done by Webb & Knapp Construction Corp. of New York and Denver, and the McKiernan-Terry equipment was supplied by Mississippi Valley Equipment Co. of St. Louis, Mo.

For your own pile-driving operations, whether large or small, you, too, can depend upon speedy, economical service from McKiernan-Terry equipment. Write for descriptive bulletins and specifications.

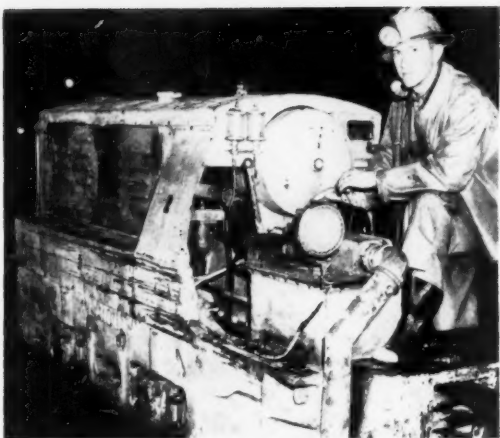


Booth 608

McKIERNAN-TERRY CORPORATION
MANUFACTURING ENGINEERS
DOVER, NEW JERSEY

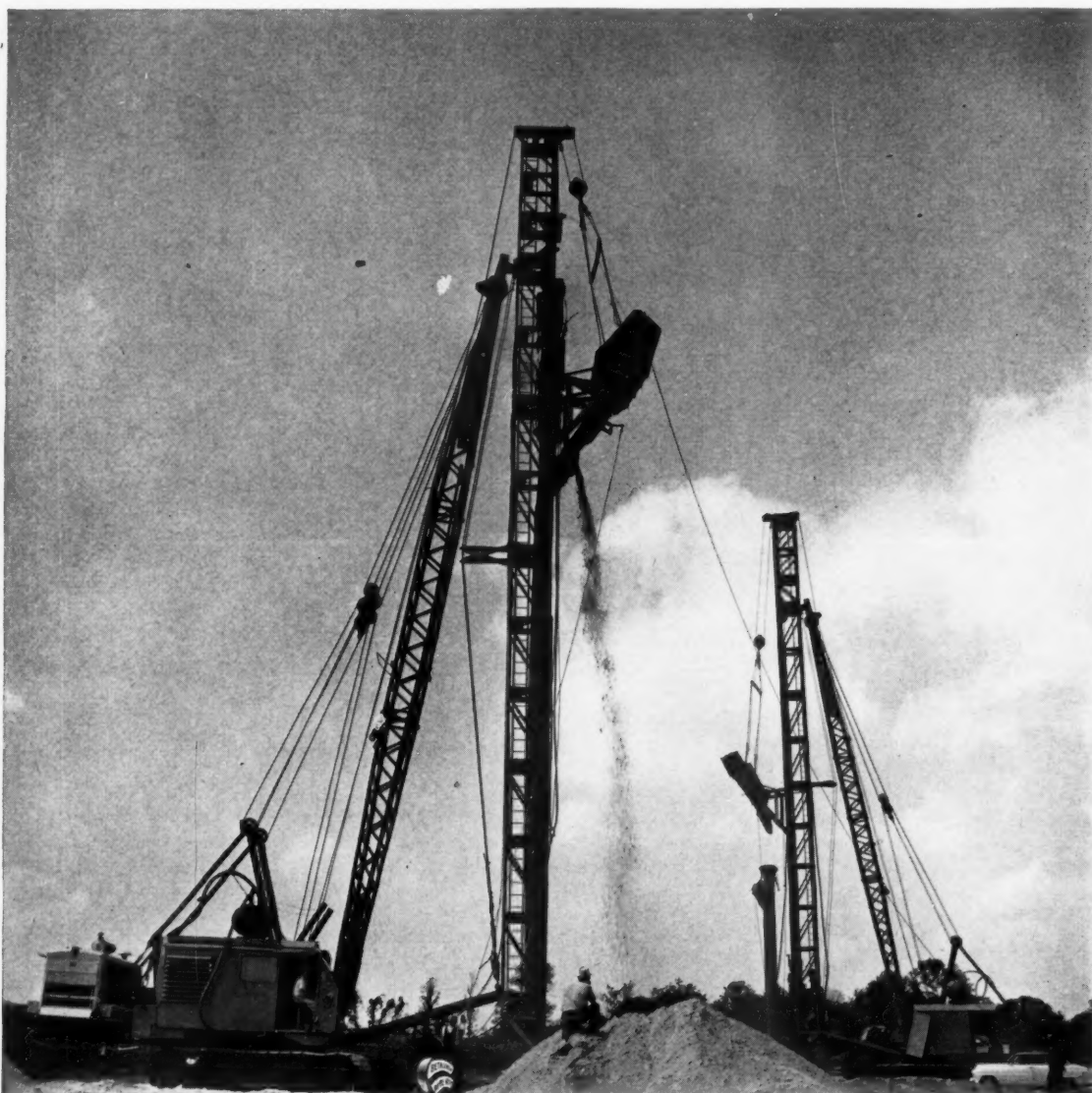
HK370

For more facts, use Reader-Reply Card opposite page 18 and circle No. 310



TUNNELING THROUGH HARD CONNECTICUT GRANITE at a pace of 85 feet per day, joint-venture contractors Coker-Kiewit have found that their quartet of Plymouth 8-ton diesel Mine-O-Motives have averaged as low as 10 gallons of fuel per 24-hour day. The job, the Genesee Tunnel, is a 4-mile water artery near New Haven, Conn. Equipped with scrubbers, the diesels work two in each direction from the 160-foot center shaft, hauling rock-laden cars to the elevator, returning empty cars plus men and material to the tunnel face, and advancing the drill-mounted jumbos as the face progresses. The Mine-O-Motives are equipped with hydraulic torque-converter drives coupled to Plymouth transmissions. For more information about the diesels write to **The Plymouth Locomotive Works, 607 Riggs Ave., Plymouth, Ohio**, or use the Request Card at page 18. Circle No. 110.

vancing the drill-mounted jumbos as the face progresses. The Mine-O-Motives are equipped with hydraulic torque-converter drives coupled to Plymouth transmissions. For more information about the diesels write to **The Plymouth Locomotive Works, 607 Riggs Ave., Plymouth, Ohio**, or use the Request Card at page 18. Circle No. 110.



Wire Rope at Work—In constructing a portion of New Jersey's North-South Freeway, Route 42, the builders were faced with a difficult drainage problem. In boglands near Philadelphia, it was necessary to drive sand drains into the earth, then place cross-drains near the surface and top everything with overburden. The weight of this top layer "squeezed" the bog and forced water up the sand columns and into the cross-drains.

Hercules Concrete Pile Co. contracted to install 500,000 lineal ft of drainage system. The photograph above shows one important phase of the work—filling a casing with sand. The task of ramming the casings into the ground was handled by hard-hitting pile-drivers. To lift the bulky rams for every stroke, the rigs were fitted with Bethlehem Purple Strand—a wire rope so tough that it stood up easily under the merciless demands of the job.

Bethlehem Steel Company, Bethlehem, Pa. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

Mill depots and distributors from coast to coast stock Bethlehem rope for the following industries and numerous others: CONSTRUCTION • EXCAVATING • MINING • QUARRYING • PETROLEUM • LOGGING • MANUFACTURING

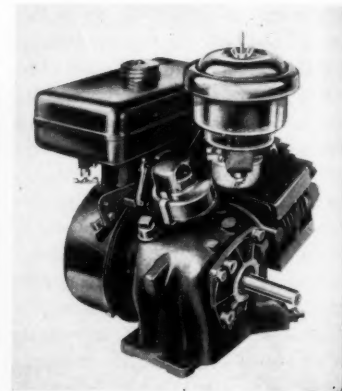


For more facts, use Reader-Reply Card opposite page 18 and circle No. 311

Three 4-hp units broaden air-cooled engine line

■ The power range of the Continental Red Seal air-cooled engine line has been expanded with the addition of three heavy-duty 4-hp models of both conventional and vertical shaft design, the manufacturer reports. The new models have been designated as the AU10, AD10, and AW10.

The new models follow the basic design of the current Red Seal AU, AD, and AW series, but incorporate changes that are said to result in greater piston displacement (9.82 cubic inches) and higher compression (6.25:1). The 4-hp output is achieved at 3,600 rpm.



The Continental Red Seal Model AU10, one of three new 4-hp units that have been added to the air-cooled engine line of the manufacturer, delivers its rated output at 3,600 rpm.

A forged double-capacity connecting rod of new design is used in the 40-pound engines. The cylinder head is of heavy-duty die-cast construction with enlarged cooling fins and eight hold-down bolts. The crankshaft also has been redesigned, and the pistons are tapered and tin-plated, with new narrow-type rings.

The valves are 33 per cent larger, and the valve lift has been increased. A bronze valve guide is used on the exhaust side, and rotators are available if needed. There is a locked-in bearing on the takeoff end of the shaft and a heavy-duty roller bearing on the flywheel end.

For further information write to the Air Cooled Industrial Engine Division, Continental Motors Corp., 12800 Kercheval Ave., Detroit 15, Mich., or use the Request Card at page 18. Circle No. 53.

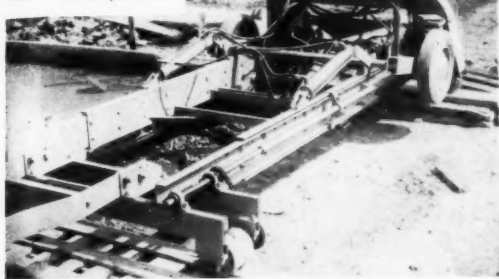
Dual tire valve

■ The Carlan valve stabilizes air pressures between a pair of dual tires and thereby prevents one tire from absorbing more than its required share of the load, according to a bulletin from Carlan Instruments Co., Inc. The self-contained valve has two checking stations and two connecting hoses which, if severed, automatically stop operation with no loss of air. Job photos and complete details on the construction of the valve are included in the bulletin.

To obtain the bulletin write to Carlan Instruments Co., Inc., 1375 Park Ave., Cranston 9, R. I., or use the Request Card that is bound in at page 18. Circle No. 8.

CONTRACTORS AND ENGINEERS

General's automatic curb and gutter machine forms a monolithic curb and gutter as fast as the main slab is poured.



Curb machine operates as main slab is poured

■ An automatic curb and gutter machine capable of forming monolithic or integral roll-type curbs on paving jobs at the same time the main slab is poured is announced by General Road Machines, Inc. The new machine is reported to sharply decrease manual labor costs.

In operation, a hydraulically-driven curb-forming roll, spinning at 300 rpm, profiles the gutter line and forms the curb as the machine travels along the forms behind the main paving train. Concrete for the curb is left along the high curb side of the slab by an accessory offset screed attachment on the finisher operating ahead of the curb machine. Changes in the curb and gutter profile are provided for by replaceable contour cams.

The machines are available with the curb-forming roll on one or both ends for half or full-width construction. The machines are offered in four sizes: 10 to 15, 12 to 18½, 20 to 25, and 18 to 25 feet. Other widths are available on special order. Frames and telescoping driveshafts are designed to provide rapid width changes without the removal or addition of parts.

For further information write to General Road Machines, Inc., N. Main St., Niles, Ohio, or use the Request Card at page 18. Circle No. 123.

Crawler tracks

■ Crawler tracks, built from alloyed manganese steel, are described in a mailing piece from the Kensington Steel Co. An anti-shear lug fits around the tie-bar on the rail link to eliminate end play and elongated bolt holes, according to the literature. Data is also included on replacement rims for worn sprockets.

To obtain Bulletin 1050 B write to the Kensington Steel Co., 505 Kensington Ave., Chicago 28, Ill., or use the Request Card at page 18. Circle No. 15.

Spannall creates two posts

Spannall of the Americas, Inc., New York, N. Y., has created two staff positions, assistant to the president and sales engineer. Eugene F. O'Callaghan has the post of assistant to the president, and Lothar W. Conrad is the new sales engineer.

Spannall is an international distributor for all-steel horizontal shoring for concrete form work.

Form-tying, anchoring

■ The latest in job-tested concrete form-tying and anchoring methods is contained in a catalog from Richmond Screw Anchor Co., Inc. A complete listing of form-tying and anchoring devices are accompanied by data on strengths, working loads, dimensions, uses, procedures, formulas, and tables. Also included in the catalog are blueprints covering many aspects of form design and construction. Data is given on the fastening and properties of planks and timbers.

To obtain the catalog write to Richmond Screw Anchor Co., Inc., 816-838

Liberty Ave., Brooklyn 8, N. Y., or use the Request Card at page 18. Circle No. 22.

Dr. Terzaghi appointed new lecturer at MIT

Massachusetts Institute of Technology has appointed Dr. Karl Terzaghi lecturer and research consultant in soil mechanics for the current academic year.

Dr. Terzaghi is an international authority on soil mechanics. He is president of the International Conference on Soil Mechanics and Foundation Engineering.



S & M Construction Company, Providence, R. I., uses 12 of these Mack LJSWX diesel dumpers under 2-yard Lorain shovel in excavating peat bog near Atholl, Mass., on a by-pass for U. S. Route 20.

ONLY A SPECIALIST NEED APPLY...

... For only Macks can get in and out of mud like this under their own power!

Axle deep in soft, soupy mire and hauling a full load of heavy peat bog, 80% water, this Mack dumper will pull out of the muck and be on its way . . . and back again on schedule.

It's Mack's famous Balanced Bogie, along with Mack's exclusive Power Divider, that makes seemingly impossible tasks like this everyday assignments for Macks. This wonder-working team delivers torque to each wheel in proportion to its

traction. In addition, it assures uniform tire loading and braking on all four rear wheels, and maximum stability under any terrain or road conditions.

When you add the Balanced Bogie and Power Divider to Mack's rugged construction, ease of maintenance, and economy of operation, you'll see why Macks are the most versatile trucks, the biggest money makers in the construction industries today. See your Mack Branch or Distributor for complete details. Mack Trucks, Inc., Plainfield, New Jersey.

MACK... first name for trucks

For more facts, use Reader-Reply Card opposite page 18 and circle No. 312

New Michigan scrapers, dozers, tractor-shovels

**Clark Equipment expands its
road building and earthmoving line**

Ready for showing at the ARBA Road Show in Chicago next month will be a new comprehensive line of Michigan scrapers, dozers, and tractor shovels, as manufactured by Clark Equipment Company's Construction Machinery Division at Benton Harbor, Michigan. In equipment of corresponding capacities, all three types feature interchangeability in such power train components as engines, power shift transmissions, torque converters, and axles. According to vice president Clarence E. Killebrew, this feature will result in operating efficiencies when the equipment works in combination, as in the case of tractor-dozers and tractor-scrappers.

The Clark executive also stated that savings in spare parts inventories would be significant—up to 60 per cent of the investment required when non-transferable parts are needed for each type of equipment. Until the present, Michigan equipment included tractor-shovels, excavator-cranes, tractor-loggers, and a single model rubber-tire tractor-dozers. The rubber-tire self-propelled scrapers are thus brand new additions.

The three types of scrapers are:

Model	Capacity	Engine
110	8 to 10½-yard	165 hp
210	12.7 to 18-yard	210 hp
310	20 to 27-yard	335 hp

All sizes have power shift transmissions to eliminate time lost in manual gear shifting and to increase operator efficiency and production. Other standard Clark equipment includes torque converters multiplying torque as much as three times engine output, four-speed power shift transmission, and planetary-wheel axles with locking differentials.

Running on low-pressure tubeless tires, the scrapers have a top speed of 30 mph for fast movement on long hauls and between jobs.

Scraper controls are fully hydraulic, and the bowls are designed with open tops for quick loading when used with tractor-shovels.

Last year Clark introduced its first turbocharged rubber-tire dozer—the Michigan Model 180, powered by a 165-hp diesel engine, and weighing 26,000 pounds. The two current new models are the 280, a 38,000-pound vehicle with an 11-foot 3-inch blade and powered by a 210-hp diesel, and the 380, a 55,000-pound machine with a 13-foot 3-inch blade and powered by a 335-hp diesel. Power train components are interchangeable with the corresponding model scrapers. Cummins heavy-duty, turbocharged diesels provide the matched horsepower for push-loading the new scrapers.



The new Michigan 110 scraper has an 8 to 10½-yard capacity, is powered by a 165-hp diesel engine, and can make a 180-degree turn on a 30-foot roadbed. Here it teams up with a Michigan 180 tractor-dozers for push loading. Matched for size, the two machines have interchangeable engines and Clark power trains.

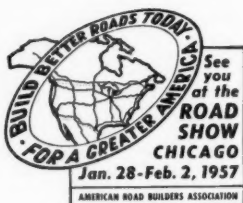
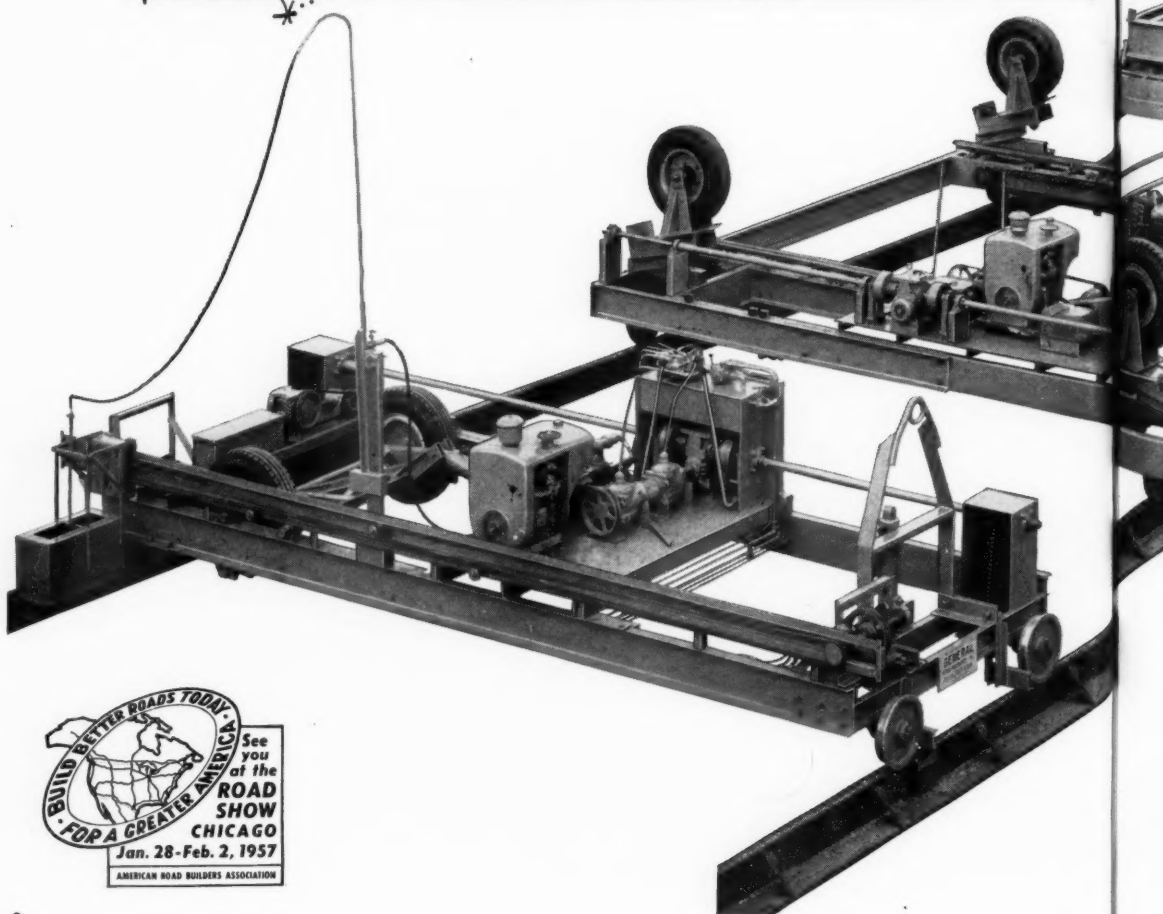
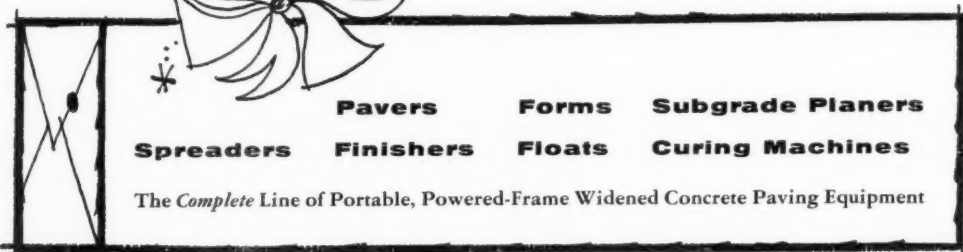
Announcing

a new "package"
for the road builder



CHAIN BELT COMPANY

GENERAL ROAD MACHINES





Another new unit in the Michigan line is the 375A 6-yard tractor-shovel, which has four speeds forward and four reverse, and a top road speed of 28 mph. It is powered by a Cummins turbocharged 335-hp diesel engine.

The 375A unit was developed to provide low-cost, high-speed loading of large hauling units like this 25-yard truck trailer. The 6-yard machine will lift 30,000 pounds while stationary, carry 15,000 pounds at 4 mph



Here's the job-speeding, cost-cutting concrete road building "package" contractors have been seeking. The combination of CHAIN Belt and General Road Machines provides a complete equipment answer from forms to curing machines—a quality line of concrete paving equipment that is unmatched in its ability to answer your needs...unequaled in its over-all ability to speed job progress.

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Why not get the complete story on the new package that can step up your paving profits...the many exclusive features offered only by these quality machines. Write CHAIN Belt Company, 4666 West Greenfield Ave., Milwaukee 1, Wisconsin.



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CHAIN BELT COMPANY

MOTO-MIXERS • BUILDING MIXERS • PUMPCRETE • RAILPORTER • PUMPS

For more facts, use Reader-Reply Card opposite page 18 and circle No. 313

Each model has a top speed of 28 mph, both forward and reverse, for high speed travel around the job.

Hydraulic controls provide down-pressure for heavy dozing. The operator can also tilt the blade by means of a double-acting tilt cylinder to pry loose rocks or stumps.

Each model carries a swinging drawbar fastened to the center of the dozer's frame, well below the center of the wheels, for attaching a sheeps-foot roller, scraper, or towing unit.

With the addition of a 4-yard and a 6-yard unit, the Michigan tractor-shovel line now includes eight models, starting with a 16-cubic-foot machine. Since May 1954, Clark has produced and sold more than 5,000 of its Michigan tractor-shovels. The new Model 275A has a 4-yard capacity. It is equipped with a 210-hp diesel. The 6-yard machine, Model 375A is equipped with a 335-hp diesel and weighs more than 50,000 pounds.

The tractor-shovels have four speeds forward and four reverse, with a top road speed of 28 mph. Standard equipment includes full power shift with the two fingertip control levers. Equipment, standard to the dozer line, includes rear-wheel power steering, air brakes, head and back-up lights, engine-hour meter, swinging drawbar, engine and torque converter oil filters.

Boom and bucket controls are hydraulic. Two double-acting hydraulic boom cylinders provide lifting power.

At a press conference introducing the new models, vice president Killebrew revealed that sales in the Construction Machinery Division had increased from \$12 million in 1954 to more than \$50 million in 1956. "And now, for the first time," he went on, "three major categories of construction machinery have been engineered as a unified line of equipment". The Clark official stated that the new equipment will be shown publicly for the first time at the ARBA Road Show, and that the machines will be in production in 1957, with initial deliveries scheduled well in advance of the start of full-scale operations on the \$34 billion national road program.

For further information write to Construction Machinery Division, Clark Equipment Co., 2407 Pipestone Road, Benton Harbor, Mich., or use the Request Card at page 18. Circle No. 127.



Sand and rock stretches complicate highway grading

Desert sand too soft to support grading equipment, and rock that had to be drilled and shot, required grading techniques from both ends of the scale for Strain Bros., Inc., San Angelo, Texas, contractor on a 17.4-mile section of U. S. 80 for the Texas State Highway Department.

Compensating for these difficulties, however, was an efficient rock-crushing setup that kept turning out material at a high rate of speed for this new roadway's flexible base and for the asphaltic-concrete topping.

The worst difficulty at the start of

the job was caused by desert blow sand, which extended from the western end of the job at Monahans to a rock formation at the center of the stretch. The sand formation began again at the other side and continued to Odessa, but in this section its shifting characteristics were less pronounced. Strain started work on a new two-lane roadway first, while traffic used the old two-lane road. Then motorists used the new stretch while the old road was reconstructed and a colored dividing median built to contrast with the asphalt pavement.

Large amounts of water

Though the cubic yardage of material handled was not too great—quantities averaging only 630 cubic yards per station or every 100 feet—Strain Bros. assigned a sizable fleet of equipment to handle the material and transform it into a pay quantity.

Two 12-yard scrapers and a pair of 8-yard scrapers, together with a tractor fleet consisting of three Caterpillar D8's, six D7's, and three D6's, picked up as much of the shifting sand as possible and dumped it to the roadbed. Four Caterpillar DW15 rub-

ber-tire units found it virtually impossible to work on the west end of the job and were assigned to the eastern end, where the sand had a greater bearing value.

A total of 250,000 gallons of water had to be hauled daily from Monahans or a well near the east end of the project to get enough bearing value into the sand. At one time, with grading work at its peak, ten water trucks, ranging from 2,300 to 4,500 gallons in capacity, were in use. Three tractors were used for towing this water-sprinkling equipment on the fill.



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Engineering Counseling available to you at no obligation. We can tailor our equipment to your specifications.



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This new AIR-FLOW type clutch was designed to provide unusual air cooling qualities. Increased torque capacity is obtained with the Morlife clutch plate. Levers are counterbalanced to eliminate self-engaging tendencies, when the clutch is idling. An unique spring-loaded feature greatly reduces frequency of adjustment. For information how this new Rockford AIR-FLOW clutch, with Morlife plate, will improve the operation and increase the on-the-job hours of your heavy-duty machines, write—



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CLUTCHES

For more facts, use Reader-Reply Card opposite page 18 and circle No. 315

CONTRACTORS AND ENGINEERS



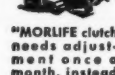
"MORLIFE clutch has gone 831 hours without slipping or adjustment."



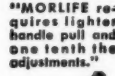
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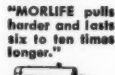
"MORLIFE clutches last 950 hours longer, without adjustment."



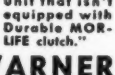
"MORLIFE needs adjustment once a month, instead of daily."



"MORLIFE requires lighter handle pull and one tenth the adjustments."



"MORLIFE pulls harder and lasts six to ten times longer."



"Won't buy a unit that isn't equipped with Durable MORLIFE clutch."

solid, right, end-dumps to a Pioneer 153 PRL, primary rock plant that turned out a daily average of 5,000 yards of flexible base. The Pioneer intermediate gravel plant, center, feeds to the secondary crusher

Tractors tow water trucks on road until bearing value is obtained; rock plants produce flexible base and hot-mix aggregate simultaneously



Two sizes of mineral aggregate for the hot-mix are turned out simultaneously by this Pioneer 46-VE Duplex plant. Rock retained on the No. 4 screen is loaded to a truck hauling to storage; the remaining rock is stockpiled.

When enough water had been applied to a section so that the sand set up for rolling, five Tamco 9-wheel pneumatic rollers, pulled by Farmall M rubber-tire tractors, went to work. In the early stages of compaction, a double set of Gebhard sheepsfoot rollers was used behind a crawler tractor to develop some bearing strength in the material to support the pneumatic units.

But even after the subgrade had been developed on this 7-mile stretch, the contractor found it necessary to construct a 3-inch-thick course of white gypsum as a plate course to prevent the sand from bogging down. After a shovel had dug the gypsum from a pit near the highway, the material was loaded to dump trucks that hauled to the roadway. Then, as the material was dumped, it was leveled by a Caterpillar D6 tractor with dozer. A Tamco pneumatic roller was then able to get onto the lift to compact the material. Immediately afterward, a Caterpillar No. 12 motor grader shaved the top off the lift so that trucks could bring in the flexible base material. In intermediate areas where the plate course was not used, flexible base material was end-dumped by trucks, and motor graders were used to complete the base course.

On the east end of the project, DW15's shaped the new roadbed. Watering and compaction work was handled with the same procedures used on the west end of the job, and, though sand was less troublesome on this stretch, tractors were still used ahead of water trucks supplying moisture to the base.

Heavy shooting

Rock was the problem in a 3,000-foot stretch near the center of the job, about 12 miles east of Monahans. In this area, a 12-foot-deep cut was made through solid limestone and caliche caprock that pushed up through the surface of the ground. The rock in this section, acceptable for the production of base-course material and aggregates for the asphaltic concrete, was crushed and screened for use on the job. Part of the material was retained in a narrow dike of rock, which was left in place to form the dividing median in this stretch.

Drilling was handled here by a
(Continued on next page)

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New lightweight . . .

Fabricated steel brake shoes weigh many pounds less than cast shoes. Binding or freezing up is eliminated because double web construction permits limited area fit with one piece cam rollers. Wear areas of the webs are heat treated for long life.

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All brake parts are mounted on the spider for compactness. Efficiency is higher and correct cam shaft alignment is assured with close coupled cam shaft and chamber bracket.*

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The outstanding features of the Timken-Detroit® "P" Series Brakes give increased economy and performance. Operating temperatures are lower and lining life longer because open-type spiders assure good internal ventilation and rapid cooling. Timken® "Econo-liners" are tapered to provide greatest thick-

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A constant-lift "S" type cam assures uniform application of brake shoes for maximum control and immediate response. Brake adjustments are quick with easily accessible slack-adjusters. Long wearing nylon bushings assure smooth operation with minimum maintenance.

"P" Series Power Brakes are available in a complete range of capacities and sizes to fit every operating requirement.

*"P" Series Brakes are also available with inboard chamber mounting for special applications.

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Even though the job is well along in the sandy area near Monahans, a Caterpillar D6 still has to tow a water truck through the loose sand. A total of 250,000 gallons of water was soaked up on this stretch daily during subgrade work.

(Continued from preceding page)

Gardner-Denver 600-cfm rotary compressor, a Gardner-Denver 500 regular compressor, two Gardner-Denver wagon drills, and two Cleveland wagon drills. Timken rock bits, in sizes that bottomed at 2½ inches in diameter, were used to sink powder holes on a 12-foot staggered grid. These holes were loaded, to within 3 feet of the surface without springing, with Gold Medal No. 5 bag powder together with a 1¼×8-inch stick of No. 2 gelatin dynamite. The gelatin-type powder was used alone for a greater shattering effect in places where the rock was solid.

The biggest difficulty on this phase of the job was in breaking up the 3 to 4-foot-diameter boulders that were

simply loosened by a blast—unless a driller was lucky enough to penetrate the boulder itself with a powder hole. These oversize boulders were broken by a Michigan truck-crane swinging a 1,000-pound breaking ball. Shock stresses on the hoist line and crane boom were cushioned by a rubber tire from an old earthmover, and this permitted the operator to stop the drop as soon as the breaking ball struck. Both the blasted material and the broken portions of the oversize boulders were shovel-loaded to a fleet of three Euclid end-dumps. These hauled between 3,000 and 5,000 cubic yards of rock daily to the high-capacity crushing equipment that turned out aggregate for the flexible base and asphaltic-concrete topping.

Flexible base goes fast

Flexible base-course material, which was turned out simultaneously with aggregate for the hot-mix surfacing in a rock plant nearby, was put down in two lifts and compacted to a total thickness of 12 inches. A total of 110 cubic yards of crushed material was dumped per station for the first lift, while 100 cubic yards were used for the second lift. The output of the rock-producing plants was so high that a truck load of material was being dumped to the grade every 20 seconds during this operation.

As soon as the flexible base material had been dumped, it was blade-mixed by four No. 12 motor graders, watered by tank trucks of 4,500-gallon capacity, then blade-mixed again. Final rolling was handled by rubber-tire tractor-drawn pneumatics, while motor graders spread the material out from windrows in thin lifts.

High rock production

The 300,000 cubic yards of flexible base material required for this job was turned out at a fast rate by a crushing-screening combination that reached a peak of 5,600 cubic yards in a 9-hour shift. Material feeding this setup was taken from three pits—salvage from the 3,000-foot-long rock cut and rock from a borrow pit near the center of the project constituting part of the supply. About 60,000 cubic yards of material for the flexible base was obtained from a third pit that required trucks to make a 3½-mile dead haul to the west end of the job, the trucks having to haul through the city of Monahans.

Initial reduction was handled by a

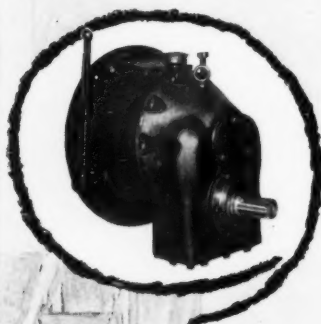
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Work Time
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CONTRACTORS AND ENGINEERS



In the 3,000-foot-long rock stretch at the center of the project, powder holes are put down by two wagon drill powered by a Gardner-Denver 600-cfm compressor. Excavated rock was processed for use in the flexible base and hot-mix.

The soft sand subgrade is strengthened by a 3-inch plate course of gypsum. A Caterpillar tractor with dozer levels a load of material so that it can be compacted.



30x42 jaw crusher, a heavy-duty unit that, like other components of the setup, was completely portable.

In line between a portable Pioneer 153 PRL primary and a portable Pioneer 154 VE secondary unit was a Pioneer No. 120 JSE intermediate gravel plant. This had a 20x36 jaw crusher and a double-screen deck. All 30-inch conveyors in these plants had been replaced by 36-inch conveyors before the job started.

The last unit in line was a Pioneer 46 VE Duplex portable crushing-screening plant, which produced two sizes of rock simultaneously. This rock, blended together, made up all the mineral aggregate needed to produce asphaltic concrete for the project. Raw feed was trucked to the unit after being taken out of one side of the 3-unit setup for the production of flexible base material.

Trucks end-dumped rock over a 6-inch bar grizzly, which passed all minus-6-inch fines to the feeder belt of the 153 PRL primary. Larger rock was routed into the 30-footx42-inch apron feeder, used in place of the standard 30-inch feeder, increased the rate of feed. A Murphy diesel engine, delivering about 175 horsepower, substituted for the 150-hp driving unit.

The primary crusher discharged to the No. 120 intermediate gravel plant, which was powered by a Murphy 125-hp diesel. Rock first dropped to a double-deck screening system, where a 4x8-foot, 4-inch screen retained the 4 to 6-inch rock fraction. This retained rock passed through a 20x36 jaw crusher, and throughs from the jaw dropped to a delivery line leading off to the roll crushers in the next plant unit.

Material passing the 4-inch screen was dropped to a screen deck with 1 1/4-inch openings. Rock passing this deck was acceptable for the flexible base and was discharged to a Pioneer conveyor belt that led to a surge bin where dump trucks loaded. The fraction retained on the 1 1/4-inch screen joined throughs from the jaw crusher to be routed by conveyor to the 154 VE secondary crushing plant.

A Murphy 175-hp engine, providing 25 horsepower higher than usual, powered this plant, which was equipped with a 3 1/2-deck screen. The upper and lower 4x12-foot screen decks had 1 1/4-inch openings, while the middle deck had 1 1/2-inch openings.

(Continued on next page)

In cramped quarters like this, Tournapull Rear-Dump turns in dump position, which moves rear wheels forward for extremely short wheel-base. With bowl raised, 22-ton capacity C Tournapull, shown, turns 180° in only 20' 8" wide area, without backing.

Short 180° turns

speed off-road shovel-to-dump cycles

If you are interested in cutting cycle time on your off-road hauls, consider Tournapull Rear-Dumps.

These high-production units are extremely maneuverable, can back into a shovel or restricted dump area faster than any haulers on the market. They make 180° turns by power steer thru geared king-pin in less than their own length. They eliminate time normally wasted maneuvering back and forth to turn in narrow quarters. They also frequently eliminate expense involved in construction of skid-plates or special turn-around areas.

Even where space is unlimited, rig's 90° prime-mover-turn gives you faster cycles. At the shovel, fast-maneuvering Tournapull Rear-Dump swings in and positions in 1 quick move. Loading unit need not sit idle while hauler operator wastes time on a wide sweeping turn, and a long, slow back-in. Quick, safe

spotting saves additional production time at fill.

Simplicity reduces maintenance

A great deal of your usual maintenance expense is also eliminated because of the simplicity of Tournapull's turn mechanism. Steering involves only an electric motor, connected to a rugged ring gear king-pin shaft. A flick of operator's finger activates motor . . . causes prime-mover to pivot up to 90° around trailing unit. Turns are made quickly, regardless of footing. There are no front steering knuckles, no reach rods, no complicated mechanisms to get out of line, maintain, or repair.

Check these, and all the other advantages of Tournapull Rear-Dumps. See for yourself how they speed haul cycles and cut costs. Write or call, any time, for owner-verified production studies and specifications. There's no obligation.

Model	Capacity	HP	Overall Length	Width req'd. for 180° turn	Travel position	Dump position
D	11 tons	138	24'10"	24'8"	18'8"	
C	22 tons	208	29'9"	28'8"	20'8"	
B	35 tons	293	35'10"	35'	27'	



LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS
A Subsidiary of Westinghouse Air Brake Company

ARBA



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For more facts, use Reader-Reply Card opposite page 18 and circle No. 321

These features, too, cut your hauling costs

Hauls anywhere—Travels safely over narrow haul roads, paved highways, city streets . . . hauls cross-country over terrain, thru muck, rock, and soft fill.

Dumps fast, clean—Electric motor lifts body quickly to any desired dump angle . . . bowl tips behind rear wheels for clean over-bank spill. Streamlined body sheds material readily.

Cuts weather delays—Power-transfer differential applies extra power to wheel on firmest footing . . . pulls rig through mud, sand, soft materials.

Rugged body loads easily—Big bowl opening is easy loading target. Three layer, all-steel bowl with tool-steel floor resists wear and shock. Available with optional tailgate.

Improves safety—More than 4 times the braking surface of ordinary haulers plus optional electrobrake, low center of gravity, excellent visibility, front-wheel drive, easy control, all contribute to maximum safety.

Reduces fatigue—Big tires and air-foam cushioned seat smooth out ride for operator. Electric power steer and 2-way power dump make work easy.

Insures future earnings—Behind basic prime-mover you can interchange other trail units: scraper, bottom-dump, lift-and-carry crane, logging-arch, flat-bed hauler. Keeps your Tournapull busy at a profit all year-around.

Tournapull—Trademark Reg. U.S. Pat. Off. R-1168-G-b

KONKURE Concrete Curing Compounds



Spray application curing membranes for freshly finished concrete surfaces — meets all city, county, State and Federal specifications. Unexcelled concrete moisture retention gives maximum strength concrete, minimizes concrete surface failures* or rainfall damage.

*In hot, dry areas, use of Konkure White is especially recommended.

GENERAL PURPOSE

KONKURE Clear — for curing concrete where retention of natural color is desired — a fugitive orange dye is used in Konkure Clear to insure application visibility — the color disappears within an hour.

KONKURE White — architecturally attractive, white pigmented, to minimize surface cracks resulting from exposure to light and heat rays in hot, dry areas.

KONKURE Black — an asphalt base waterproofing and curing compound competitively priced — also serves as a bonding agent for asphalt tile application.

KONKURE Gray — glare reducing — gray pigmented to minimize surface cracks resulting from exposure to light and heat rays in hot and dry areas.



TILT-UP and LIFT-SLAB

KONKURE P. C. C. — a resin base curing compound and bond breaker combined — may be painted without treatment upon erection.

Special Manufacturers Price to Large Users

KONKURE, INC.

6742 Stanton Avenue, Buena Park, California

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FOUNDATION

**For Faster Installation
and Lower Pipe Line Cost**



With Naylor lockseam-spiralweld pipe and the one-piece Naylor Wedge-Lock coupling, you have the basic ingredients for pipe lines that can be installed faster and at lower cost.

The light weight of this distinctive pipe makes it easy to handle and install on construction jobs. Its high ratio of strength to weight enables you to use it in service normally requiring heavy-wall-pipe — thus reducing material cost.

With the Naylor Wedge-Lock coupling, lines can be made up faster because pipe lengths can be joined more quickly than by ordinary methods.

For the right start on water, air, ventilating and materials-handling lines, you'll be time and money ahead to specify these Naylor products.

Write for Bulletins No. 507 and No. 513.

**NAYLOR
PIPE**



NAYLOR PIPE COMPANY

1270 East 92nd Street
Chicago 19, Illinois

Eastern U. S. and Foreign Sales Office: 350 Madison Avenue, New York 17, New York
For more facts, use Reader-Reply Card opposite page 18 and circle No. 323



The roadway begins to shape up as a lampo pneumatic roller, pulled by a Farmall M tractor, compacts the flexible base. This material was put down in two lifts and compacted to a 12-inch thickness.

(Continued from preceding page)

ings. The feed was split to the top and bottom decks by a baffle plate that could be adjusted to regulate the inflow of material to the top and bottom decks. This in turn regulated the output of the middle deck.

Material dropping from both 1 3/4-inch screens was routed through a 5424 twin roll-crushing unit, arranged in close circuit with the screening system, which turned out an all-fractured product. Most of the roll-crusher output passed to the surge bin for the flexible base while a minor fraction, retained on the middle deck, was passed through two spouts at each corner for the manufacture of hot-mix aggregate.

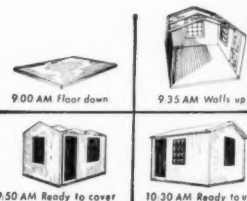
In a 10-hour run, this triple-unit setup turned out 5,576 cubic yards of flexible base rock—the largest particles of which, meeting specifications, passed a 2-inch round screen—together with 100 to 110 cubic yards per hour of crushed 1 1/2-inch rock for use as asphaltic-concrete aggregate. Specifications required this rock to be a well graded 3/4-inch-minus product. Even when the raw feed contained a

high percentage of boulders and the crushing percentage was between 65 and 80, the plant put out more than 3,300 cubic yards of material per shift.

Aggregate for hot-mix

Raw feed for the 46 VE portable plant was hauled about 1,000 feet to the unit by dump trucks that hauled from a 21-yard surge bin at the Pioneer 154 secondary plant. At the 46 VE plant, the material entered the feeding conveyor with the help of a Pioneer reciprocating plate feeder, then passed over a 3-deck, eccentric-type low-angle screen to fall to the middle deck. This vibrating screen, with 5/8-inch openings, was balanced so that it developed optimum screening action under any load. Rock retained on the screen dropped to a 1036 jaw crusher. Throughs from this unit then passed over a return route to the top screen deck, which also had 5/8-inch openings. Fine material meeting size requirements dropped through the middle deck and was separated for size on the bottom No. 4 screen. Material retained on the upper deck

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PERMANENT but PORTABLE union-built construction buildings of finest kiln-dried, tongued and grooved West Coast lumber. No foundations needed. Sections bolt together quickly for strong, rigid, on-the-job service. Easily dismantled and moved. Buildings come complete with wooden floor, skids, roofing, doors, windows, hardware and prime-coated exterior.

ECONOMY Construction Buildings are available in many sizes to satisfy any space requirements. Three buildings in picture L to R 14x33' (\$1034.00), 14x26' (\$818.00), 10x12' (\$347.30) F.O.B. West Chicago, Illinois.

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SAVINGS — Original cost + erection + reuse + resale value!

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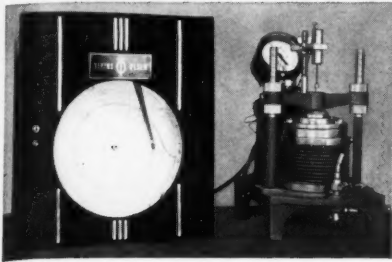
ECONOMY BUILDINGS INC.
(SINCE 1922)

West Chicago 25, Ill.
Phone 797

For more facts, use Reader-Reply Card opposite page 18 and circle No. 324

CONTRACTORS AND ENGINEERS

New instrument records time-settlement data



The K-W Autocon recorder, Model 35, provides accurate, permanent time-settlement data from soil consolidation tests.

■ Accurate, permanent records of time-settlement data from soil consolidation tests are said to be made automatically with the new K-W Autocon recorder announced by the Tinius Olsen Testing Machine Co. According to the manufacturer, this new circular chart recorder eliminates human error in recording fundamental soil compression values while assuring greater accuracy in transposing time-settlement data to the conventional square-root-of-time or log-time bases.

Recording instrumentation on the Autocon Model 35 includes a specially designed time-versus-deformation in-

dicator and a compression detector said to be adaptable to most consolidometers. Once the recorder is set the entire test is recorded automatically as a curve on the chart.

During the first hour of testing, the chart makes one full revolution so that settlement values can be read in intervals of five seconds. After the first hour, chart rotation is automatically reduced on one revolution per 24 hours until stopped.

For further information write to the Tinius Olsen Testing Machine Co., 5649 Easton Road, Willow Grove, Pa., or use the Request Card at page 18. Circle No. 74.

(Continued from preceding page)

passed to a 40x22-inch roll crusher, arranged in closed circuit with the upper deck. This permitted all the rock to be reduced progressively by the crushers. The rock dust fraction, pulled from beneath the No. 4 screen, was dumped off a conveyor and pushed to a storage pile by a tractor and dozer. Material retained on the No. 4 screen passed to a 21-yard surge bin from which loaded dump trucks hauled it to storage.

On average days, about 110 cubic yards of rock was routed through the plant, 70 cubic yards emerging as rock aggregate and 40 yards as rock dust. This material later was blended for use in the hot-mix.

After the troublesome job of working against sand and rock to complete the grading and subbase, Strain Bros. found the job of handling the 3,000 to 5,000-cubic-yards output of the plant one of the better phases of this project.

Personnel

District 6 of the Texas State Highway Department at Pecos, headed by R. L. Faltinson, district engineer, supervised this project. W. A. Davis was resident engineer for the district. Job supervision for the contractor was done by L. J. McNamara, with Ray Smith in charge of the crushing operation.

THE END



"Snake-Style" wall for Omaha Auditorium grounds. Peter Kiewit & Sons, Omaha, Gen. Con.

Symons Forms on Serpentine Retaining Wall

Symons Forms were used exclusively to form this serpentine retaining wall which is 20 feet high at the highest point and slopes to 8 feet high at the lowest point. These walls were constructed to facilitate parking on the ground of Omaha, Nebraska's new city auditorium. Symons Forms were used for 30,000 square feet of forming on this job.

Send plans for your next job and get complete layout and cost sheet—no obligation. Catalog F-10 sent FREE upon request. Symons Clamp & Mfg. Co., 4251 Diversey Avenue, Dept. M-6, Chicago 39, Illinois.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 326

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**ECONOMICAL
ANSWER**
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STRIPS
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TONGUE and GROOVE JOINT

DURABLE IN SERVICE:

Preformed mastic composition absorbs expansion of slab—without extrusion. An effective, efficient bearing surface between slabs to prevent spalling at joint surfaces. Won't rust or rot.

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More than sufficient strength to resist deforming forces of concrete placement... yet lightweight and easy to install.

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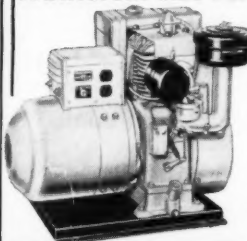
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Power Plants Speed Construction

USE POWER TOOLS—FLOOD LIGHTS

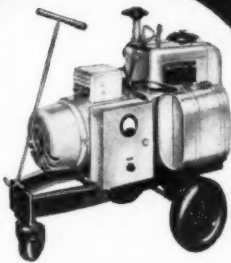
WINPOWER PORTABLE ELECTRIC PLANTS provide a dependable, low cost power source... speed up work performance by operating time and labor saving power tools. Wherever the job—whatever the need—you can count on a WINPOWER Electric Plant to meet your requirements.

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**800 WATTS
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All Standard
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These rugged, heavy-duty 3-wheel dollies are used as a permanent mounting for 3, 4, and 5 KW electric plants where portability is desired by contractors, bridge builders, mine operators, road constructors, railroads, cities and municipalities.

Trailer-Mounted Floodlight Unit

MAKE NIGHT HOURS PAY with NITE-HAWK

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Tows at highway speeds on heavy-duty trailer with leaf springs—retractable caster wheel. This is the finest, most flexible unit available. 5 KW, 115 or 250 Volt.

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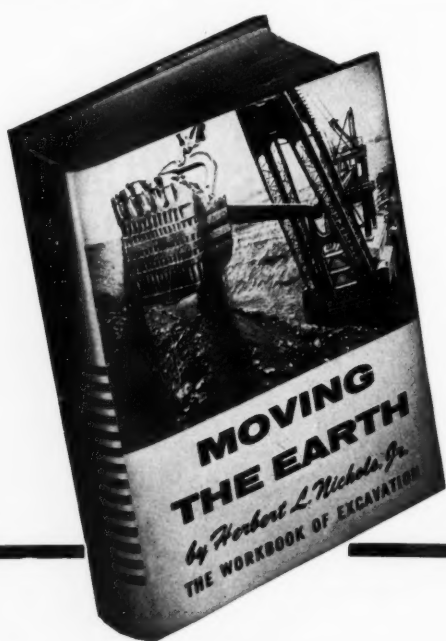


Winners in this year's annual Aesthetic Bridge Competition—the 28th to be held by the American Institute of Steel Construction—include the **Missouri River Bridge** (above, left) at Leavenworth, Kans., selected

for its "clean, simple, repetitive design." Placing first in Class I, for bridges with spans of 400 feet or more, it was fabricated by the Kansas City Structural Steel Co. The **Ohio Turnpike Bridge** over the Cuyahoga



River (above, right) won in Class II, for spans of less than 400 feet and costing more than \$500,000. "An interesting use of two materials in juxtaposition" was the



The First Reference Book To Cover Every Aspect of Excavation and Earthmoving

Written by a contractor of twenty years' experience who is a recognized authority in this field. **MOVING THE EARTH** contains detailed descriptions of exactly what operations the excavating contractor must perform on literally hundreds of different jobs. You'll also find in it a wealth of information on the operation, maintenance, and repair of just about every machine used in excavating work.

MOVING THE EARTH contains 1,200 pages and 1,200 photos that can show you the way to lower costs through more efficient operating methods that will also produce better work. The enormous scope of this book—truly "A Workbook of Excavation"—is indicated by the 15-page table of contents listing hundreds of topics.

21 chapters are divided into 2 parts. Part One deals with the work—describing every operation from digging a cellar to grading a superhighway. Part Two describes every important type of excavating and earthmoving machine—how it is made and why, what it will do and how to run it, and—above all—how to take care of it.

You may obtain your copy, on approval, from:

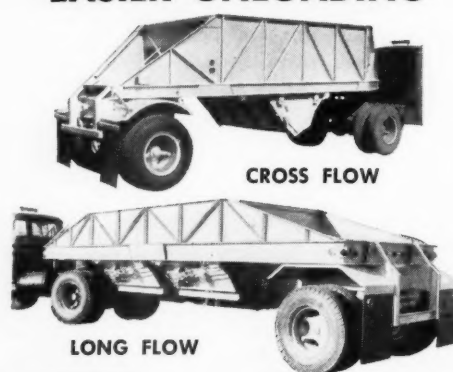
Book Order Department
CONTRACTORS and ENGINEERS

470 Fourth Ave., New York 16, N. Y.
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MOVING THE EARTH
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For more facts, circle No. 1

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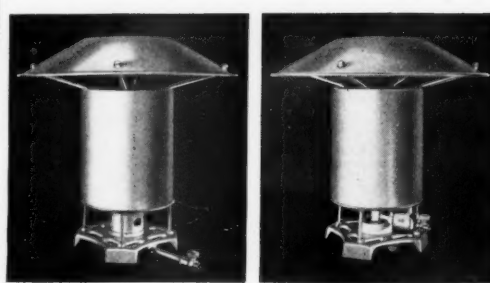
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Weldit THERMO-DISC SALAMANDERS



MODEL #800

MODEL #900

Weldit, Inc. presents their new improved line of L-P Salamanders. Featuring the famous "Flame Dome" for 360 degree heat and introducing the amazing "Thermo-disc" for extra heat radiation. 100% automatic shut-off on Model #900. Tank top Model #1850 also available.



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990 OAKMAN BLVD.
DETROIT 38, MICHIGAN

For more facts, circle No. 329

Portland Cement Assoc. revises two booklets

The Portland Cement Association has issued two revised booklets, "Soil-Cement Construction Handbook" and "PCA Soil Primer". The first booklet contains practical and detailed procedures for building a soil-cement base course under various soil and topographical conditions. Supplementary information on inspection and field control, and a resume of soil surveying, sampling, and laboratory testing are also included.

Basic information on soil and its influence on the design, construction, and performance of pavements is given in "PCA Soil Primer". Treatises on soil science as related to pavement conclude the booklet.

Single copies of the booklets are available free from the Portland Cement Association, 33 W. Grand Ave., Chicago 10, Ill.

Skid shovels, attachments

A 16-page general catalog covering the entire line of Drott skid shovels and attachments for International crawler tractors is available from the International Harvester Co. The catalog includes on-the-job photographs showing various International rigs using the attachments, and diagrams illustrate the latest improvements in the Drott line.

To obtain Catalog K-656 write to the International Harvester Co., 180 N. Michigan Ave., Chicago 1, Ill., or use the Request Card at page 18. Circle No. 81.

Asphalt, oil equipment

Equipment for heating, dispensing, and storing asphalt and other petroleum products is described in a catalog from the Blackwell Burner Co. The catalog covers pipeline and paving equipment, oil and LP gas burners, portable furnaces and space heaters, hand spraying units, and fuel tanks. Repair kits and parts for the equipment are also described.

To obtain Industrial Catalog No. 7 write to the Blackwell Burner Co., 5033 W. Commerce St., San Antonio 7, Texas, or use the Request Card at page 18. Circle No. 102.

CONTRACTORS AND ENGINEERS



ll, for
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ing use
was the

jury's comment on the bridge, fabricated by Bethlehem Steel Co. In Class III, for bridges with fixed spans under 400 feet and costing less than \$500,000, the winner was the **Old State Route 8 Bridge** (above) over the Ohio Turnpike near Cleveland, which was commended for "its simple arch". Allied Steel Co. was the fab-

ricator. **The Welfare Island Bridge** (above, right), over the East River in New York City, took the top spot in Class IV for movable-span bridges. It impressed the jury with "the simple appearance of a complicated design". Harris Structural Steel Co., New York City, was the fabricator and erector.

Plywood faced forms

■ Magnesium frame and plywood faced forms, called Mag-ply, are detailed in a catalog from the Symons Clamp & Mfg. Co. According to the catalog, the forms are available in lengths of 4, 6, 7, and 8 feet, and in widths of 14, 16, 18, and 20 inches. Data is included on assembling the forms for corners, pilasters, walers, fillers, and for bracing and scaffolding. Also pictured and described are form ties, shores, and column clamps.

To obtain Catalog No. MF-2 write to the Symons Clamp & Mfg. Co., 4249 Diversey Ave., Chicago 39, Ill., or use the Request Card at page 18. Circle No. 50.

Transmission manual

■ A manual on power transmission machinery is available from the Dodge Mfg. Corp. Topics covered in the manual include bearings, bushings, chains, base plates, clutches, couplings, sprockets, and speed reducers. Information is also given on key-seats, V-belt drives, sheaves, pulleys, and shafts. Tables, diagrams, charts, and photos supplement the material in the 328-page manual.

To obtain the manual write to the Dodge Mfg. Corp., Mishawaka, Ind., or use the Request Card at page 18. Circle No. 10.

All-aluminum trusses to be erected in Mich.

Early next year, all-aluminum overhead sign trusses will be erected at 74 points on the Ford and Lodge Expressways near Detroit, Mich. The signs were designed by the Michigan State Highway Department engineers, in cooperation with Michigan State University and the Aluminum Co. of America.

Four welded horizontal tubes and tube diagonal bracing make up the trusses, which will be 50 to 100 feet long. Vertical tubes, two at each end of the truss, with tubular diagonal bracing will provide support. Bridges 60 feet or less, will be supported by 7-inch aluminum tubing, while those 65 to 100 feet will be supported by 8-inch tubing. The average weight of the trusses will be 3,300 pounds.



Economical 5-arch stream crossing made from Beth-Cu-Loy pipe

Bridges are not always expensive, as this interesting example shows. Here we see five 60-in. galvanized Beth-Cu-Loy culverts laid side by side, with concrete retaining walls to hold back 3 ft of roadway fill. The result: an economical, easy-to-build stream crossing that will last for years.

In a wide variety of jobs the versatility of Beth-Cu-Loy corrugated galvanized steel in drainage structures is gaining rapid recognition. This stems from a number of reasons of which strength, of course, is one. Light weight makes handling, shipping and installing less costly. Flexibility permits the pipe to flex with the fill, conform to grade and alignment, absorb impact, vibration and the action of shifting and freezing soils.

Beth-Cu-Loy is open-hearth steel, with a small amount of copper added to provide resistance to

corrosion. As an additional protection, the Beth-Cu-Loy corrugated sheets are given a tight 2-oz coating of Prime Western zinc. Some corrugated steel drainage structures have been in service fifty years and more, outliving the original project, and they haven't said "uncle" yet!

Beth-Cu-Loy galvanized sheets conform to the rigid specs of the American Association of State Highway Officials. For further ideas on how this durable material might serve you and your community, just get in touch with any Bethlehem district sales office, and they will direct you to one or more fabricators who use Beth-Cu-Loy Sheets.

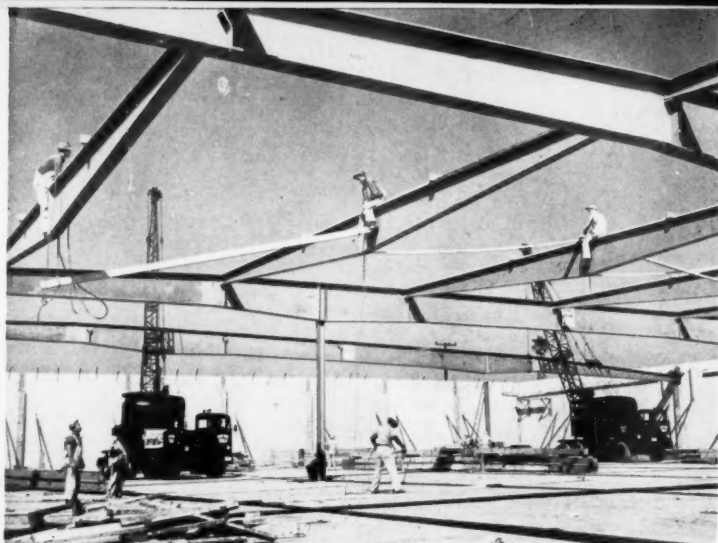
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

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BETHLEHEM STEEL



For more facts, use Reader-Reply Card opposite page 18 and circle No. 330



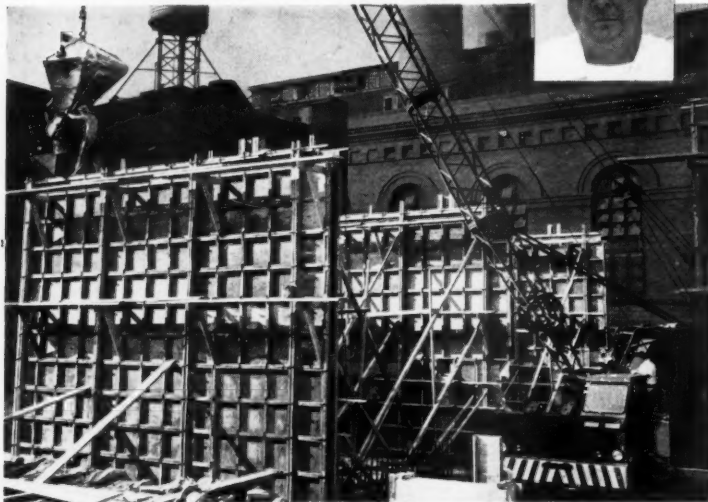
Maximum headroom and a minimum of steel is provided for the Rose-Derry Co. plant in Los Angeles by special girders being set by Lorain Moto-Cranes. The 6-ton, 190-foot-long Kaiser Steel plate girders have stress patterns that eliminate the need for much of the depth required by rolled beams.



Non-plastic fill is spread on the 27,200-foot-long levee of the Picacho reservoir near Coolidge, Ariz., by a Caterpillar D8 tractor during reconstruction of the flood-control and irrigation facility. This job includes cleaning the reservoir of a 25-year accumulation of silt.

"The industry has needed an on-the-job form assembly system like this for a long time."

Lawrence H. Johnston, Form Construction Superintendent; Rosoff Bros., Inc. and Amdor Structures, Inc.



Major Concreting Economies Laid to New Richmond Forming Method

"Everything goes faster—setting the forms, pouring, taking the forms down. No doubt about it, the new Richmond Snap-Ty Form System is the modern way to form and pour."

Mr. Johnston has used this prefabricated panel system on several Rosoff-Amdor projects . . . started as soon as Richmond introduced its new booklet of modular panel forms and made available hardware for putting together prefabricated panels easily—right on the job.

Rosoff-Amdor builds the panels on the job—uses them over and over again. For this job, they stacked them horizontally, used the walers vertically. For walls under 15 feet, they use 3,000-lb. Richmond Snap-Tys; for the high walls, 5,000-lb. Snap-Tys. They pour 26-foot-high walls like these in a single day in one continuous pour.

For erection of light foundation wall forms, Richmond Snap-Tys and accessories give you worthwhile savings all along the line. Head washers of Snap-Tys are made of special-strength steel securely held by a clean, well-formed upset at each end to give positive bearing to the Tyholder. This transmits the full strength of the Snap-Ty to the

walers and prevents costly form breaks. Break points are set back from the wall face. This permits clean, easy stripping and prevents spalling of the concrete.



You, too, can benefit by using this fast, easy method for erecting light foundation walls. See for yourself. Send for your copy of the new Richmond Snap-Ty Form Book containing complete diagrams and forming data. It's free for the asking.

Richmond does not make, rent or sell forms. Richmond sells form-tys and accessories only. The free 20-page booklet tells you how to make and assemble your own forms that can be used over and over. Send for it. Ask, too, for your copy of the new Richmond Handbook, which describes the full line of Richmond-engineered tying devices and accessories. Write to: RICHMOND SCREW ANCHOR COMPANY, INC., 816 Liberty Ave., Brooklyn 8, N. Y. or 315 South Fourth St., Saint Joseph, Mo.



Some of the new accessories developed by Richmond for easy on-the-job assembly of prefabricated modular form panels.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 331

Arc Welding Foundation announces design awards

The James F. Lincoln Arc Welding Foundation of Cleveland, Ohio, has announced awards in the engineering undergraduate mechanical and structural design competition. Wayne Quinton of Seattle, Wash., received the first award of \$1,250. Quinton, a junior last year in the mechanical engineering department of the University of Washington, designed a small arc-welded air compressor for home use. Scholarship funds amounting to \$1,000 were granted to the mechanical engineering department of the University of Washington.

John Tierney and Karl Bartzsch, civil engineering seniors at Cooper Union in New York, N. Y., designed a welded Wichert plate girder to compare it for savings with an existing riveted girder on a Raritan River bridge in New Jersey. They shared \$1,000 and Cooper Union received scholarship funds of \$500.

The third award of \$500 was presented to Richard Moran of Canton,

Ohio. He, as a civil engineering senior at Georgia Institute of Technology in Atlanta, compared a conventional riveted building frame with a welded rigid frame designed according to the theory of plastic analysis. Scholarship funds of \$250 were given to the civil engineering department of Georgia Tech.

A total of 43 other awards were made to engineering students.

The welding progress awards, also sponsored by the foundation, presented Herman Tachau of Santa Fe, N. Mex., with the first award of \$5,000 for a complete and thorough outline of a plan to design machines and structures for arc welding rather than some other metal joining method. Tachau, an engineer with the New Mexico State Highway Department, pointed particularly to the structural field where he claimed that a potential of some 3½ million tons of riveted or bolted steel could be welded with a 20 per cent saving in material.

FINEST PRECISION SWIVELS IN THE WORLD

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→ There are many practical, diversified uses for Miller Swivels, in capacities from 700 lbs. to 250 ton. 16 different styles in stock . . . special adaptations designed on request.

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For more facts, use Reader-Reply Card opposite page 18 and circle No. 332

CONTRACTORS AND ENGINEERS



Working at a sharp angle, the recently introduced Huber-Warco 6-D-2 motor grader, powered by a Cummins 125-hp diesel, brings to proper grade a bank along a stretch of rural road in Franklin County, Tenn. The road job is being done under the county's current improvement program.



Gang forms of 10x24 and 15x24-foot Symons form panels are set for the 2,400-foot-long retaining wall along the Mississippi in St. Paul, Minn. An average of 140 linear feet of wall was poured daily, making possible an early start of work on Shepard Road along the river.

Malleable wire rope clip designed for durability



■ Malleable wire rope clips designed for durability and maximum tension are available from the Hoboken Bolt & Screw Co. The clips are recom-

mended for building, highway, blasting, and demolition contractors.

The saddle seat of the HBS malleable wire rope clip is especially grooved to match the contours of each strand of the wire rope. According to the company, this feature safeguards the strands under extreme pressure and assures complete safety and strength.

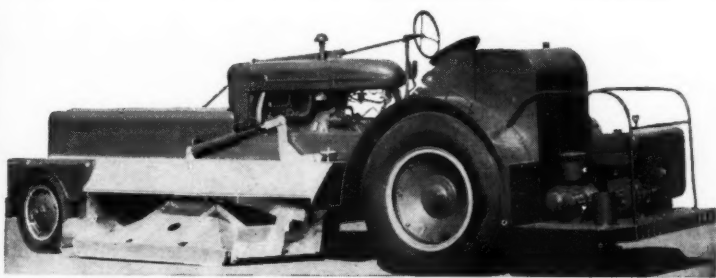
The clips are available galvanized or self-colored in five sizes between $\frac{3}{8}$ and $\frac{7}{8}$ inches. The galvanizing is a heavy commercial zinc plating.

For further information write to the Hoboken Bolt & Screw Co., Willow Ave. at 17th St., Hoboken, N. J., or use the Request Card at page 18. Circle No. 126.

Garrett Corp. erecting laboratory buildings

The Garrett Corp. of Los Angeles, Calif., has started construction on two laboratory buildings of the AiResearch division in Los Angeles.

The new buildings will give a total of 150,000 square feet of working area for testing and research programs in California and Arizona.



2000°F. working for you under this hood!

1. Jets of Monatco rectangular burner are so arranged that flame covers entire surface under hood, with practically uniform temperature. Burns standard No. 2 fuel oil.
2. Separate engine, at rear, powers fuel and air pumps. Delivers steady, soft reducing flame that does not ignite gases rising from pavement. No incineration of asphalt. No smoke.

THE MONATCO ASPHALT HEATER - PLANER

U. S. Patent No. 2,705,906

Get the complete story of how — with one machine — one operator, in one operation — you can heat, soften, plane, and condition your asphalt — at costs ranging in some cases lower than 10 cents per yard!

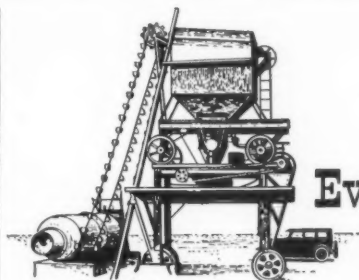
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MONATCO MFG. CORPORATION • 1401 Woodland, Kansas City, Mo.

Dealership available in a few areas

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DECEMBER, 1956



Even after 40 years...

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A personal visit to a Standard Asphalt Plant is Standard Steel's best selling aid—true for more than 40 years because Standard has always produced the most efficient, most economical plant in the world! Contractors like the Standard because it's trouble-free, fast acting—with an extra big capacity and smooth push-button operation! This large capacity is because of Standard's own super-efficient Standard-Hersey dryer (famous the world over), the large vibrating screens, giant sized elevators, and Standard's exclusive mixer. Of course, all this is typically true of Standard's 40-year leadership.

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STANDARD STEEL CORPORATION



5007 Boyle Ave., Los Angeles 58 • 15 Park Row, N. Y. 7

For more facts, use Reader-Reply Card opposite page 18 and circle No. 334



Plenty of room is assured for the operations of the new truck terminal being located outside Alcoa, Tenn. A Euclid S-7 scraper, push-loaded by a Caterpillar tractor, cuts earth to grade for the new facility which is being built by Harrison Construction Co., Knoxville, Tenn.



A good start on moving three million cubic yards of material at Beardsley Dam, Calif., is made as a Manitowoc 4500 dumps 5½ yards of material to a Euclid end-dump. The dam, on the Stanislaus River, is part of a tri-dam project for the Oakdale and South Joaquin irrigation districts.

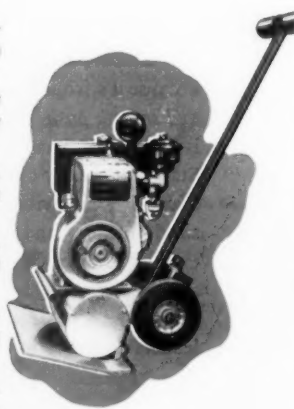
Mister... COMPACTION can be done at a profit



LISTEN

Here's how to get the
LOWEST POSSIBLE AVERAGE COST

- THE JAY TAMPER is the **ONLY** machine that eliminates costly tamping and poor compaction.
- THE JAY TAMPER combines **VIBRATION PLUS IMPACT** to keyseat the material to maximum uniform proctor densities.
- THE JAY TAMPER is a **LOW CAPITOL** investment **SELF CONTAINED UNIT**. Needs no expensive auxiliary equipment.
- THE JAY TAMPER is **LOW** in **MAINTAINANCE COST**. Field reports prove 80c per machine per month parts expense.
- THE JAY TAMPER is **LOW** in **OPERATING COST**. **ONE MAN** can operate the Jay **ALL DAY LONG** without excessive fatigue on but two gallons of gasoline.
- THE JAY TAMPER gives you **HIGH SPEED PRODUCTION** contractors claim machine pays for itself in 3 days over methods previously used.
- THE JAY TAMPER is **PORTABLE** and **VERSATILE**. **COMPLETE** unit weighs only 240 pounds, has interchangeable tamping shoes that can be changed in seconds to fit any job or soil condition.



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Please send me additional information on the **JAY TAMPER**

My name _____

Street _____

City _____

Zone _____

State _____

Mail coupon below
for name of nearest dealer.

For more facts, use coupon, or Reader-Reply Card opposite page 18 and circle No. 335

Hand truck moves loads of palletized materials

■ A hand truck designed for moving 1,000-pound loads of such palletized materials as sacks of cement is announced by Valley Craft Products, Inc. The Ezy-Tilt pallet truck is available optionally with 2-wheel safety brakes.

A special shoe automatically locks the truck into a tilted position as the truck is moved vertically against the load, allowing the tipping action to be accomplished with a minimum of effort, the manufacturer reports.

Because the frame of the truck is always in contact with the load, safe tipping is possible, according to the company. When the load is tilted to approximately a 45-degree angle, it reaches a balance point at which it will rest without the operator touch-



ing the truck, the company points out.

For further information write to Valley Craft Products, Inc., 770 Jefferson Ave., Lake City, Minn., or use the Request Card at page 18. Circle No. 107.

Austin Co. to build plant for Lincoln Electric Co.

The Austin Co. engineers and builders of Cleveland, Ohio, have been contracted to expand Lincoln Electric Co.'s electrode and machine plant in

Cleveland. The \$5½ million facility will have Fiberglas-insulated aluminum and steel sandwich walls similar to the initial structure.

NEW FEATURES FOR ADDED PROFITS

MEASURES
AND CUTS SOD
AUTOMATICALLY

TWO SPEED
TRANSMISSION

COMPLETELY
SEALED
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Designed for ruggedness and dependability, the Auto-Cut-Off Model with instant depth and blade adjustment, two-speed transmission, completely sealed gear case and increased engine horsepower . . . features that make RYAN now, more than ever, the finest power sod cutter in the field.

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Ryan landscaping
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Dept. K1, 871 Edgerton St., St. Paul 1, Minn.

For more facts, use Reader-Reply Card opposite page 18 and circle No. 336

Phone:
VAN Buren 8876

CONTRACTORS AND ENGINEERS

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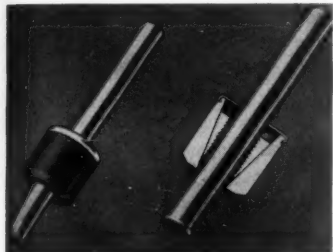
A small but important job at the site of Brownlee Dam, about 29 miles west of Cambridge, Idaho, is done by a Bucyrus-Erie 22-B dragshovel. The rig is excavating a 1,300-foot trench, 4 feet wide and 8 feet deep, through blasted basalt for a sewer line to the Morrison-Knudsen camp site.



Modernizing a 5-mile section of State Route 37 between Ojibwa and Ladysmith, Wis., an International 75 Payscraper is push-loaded by an International TD-24. Excavation and borrow totals 500,000 cubic yards on the 200-foot right-of-way which has 21-foot-deep cuts and 32-foot-high fill.

Wedge nuts eliminate need for threads or lock nuts

■ A new type of nut that grips tie rods without the use of threads, lock nuts, or lock wires is announced by Morrow Mfg. Co., Inc. Wedgnuts are



The heavier the pull on the Wedgnut, the tighter it will grip the rod.

available in 1/4, 3/8, and 1/2-inch sizes and require no special tools.

The Wedgnut consists of an internally-coned outer shell that holds a pair of tapered wedges and an end cap. The inner faces of the wedges contain several rows of teeth. When the Wedgnut is slipped over the end of a threadless tie rod, the teeth on the wedges grip the rod with a point-of-contact penetration that will never slip, the manufacturer reports.

The heavier the pull on the new type of nut, the tighter the grip of the teeth. According to the company, the rod broke before the nut slipped in a tensile ability test.

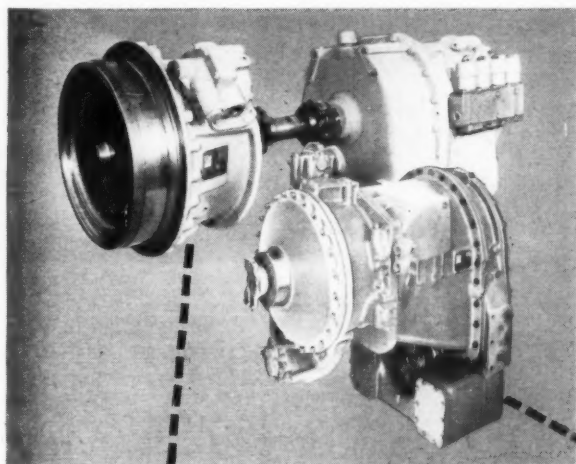
For further information write to Morrow Mfg. Co., Inc., RFD No. 1, Old Baptist Road, East Greenwich, R. I., or use the Request Card at page 18. Circle No. 40.

Line of winches

■ The complete line of Ramsey winches is described in a bulletin from the Ramsey Winch Mfg. Co. The underslung models are built for front mounting, but may also be mounted on the rear of a truck, according to the bulletin. The J Series, with capacities ranging from 8,000 to 45,000 pounds, is for behind-the-cab mounting.

To obtain Bulletin 1003 write to the Ramsey Winch Mfg. Co., Box 3067, Tulsa, Okla., or use the Request Card at page 18. Circle No. 21.

Both ends working against the highway muddle



Allison TORQMATIC DRIVES make it possible for this big Euclid TS-18 Twin Power scraper to "eat up hills" and build a highway.

Note well that "Twin Power." For this scraper has two engines and two TORQMATIC Converter-Transmission teams. Only with the advantages of the converter-transmission team can two power units at opposite ends work simultaneously pushing and pulling.

To contractors these twin TORQMATIC teams mean faster work, more payload hauled and less equipment needed to do a bigger job. That's real Allison economy.

You can get Allison TORQMATIC DRIVES in a wide range of equipment built by almost 100 manufacturers. For full details on Allison TORQMATIC DRIVES for the equipment you buy or build, write Allison Division of General Motors, Box 894C, Indianapolis 6, Indiana.



TORQMATIC DRIVES

For more facts, use Reader-Reply Card opposite page 18 and circle No. 337

The following article is the last of three excerpts from the book, "Modern Techniques of Excavation", by Herbert L. Nichols, Jr., published this year by North Castle Books, Greenwich, Conn. Mr. Nichols is well known as the author of "Moving the Earth" and "How to Operate Excavation Equipment", excerpts from both of which have appeared in these pages. "Modern Techniques of Excavation", a shortened and revised version of "Moving the Earth", is priced at \$9.00.

Hints on maintenance: Internal combustion engines

The majority of excavating and hauling machines use gasoline or diesel engines. These are called internal combustion engines because fuel is burned inside the same unit that turns the shaft. They were given the name to distinguish them from steam engines, which burn fuel to make steam and then pipe the steam to an engine that converts it to usable power.

Gasoline and diesel engines have many things in common. They burn a mixture of air and fuel, turning the heat of their explosive combination into pressure against a piston on a crank that turns a shaft. They must use clean air and clean fuel, keep a film of oil on all moving parts, should be kept at an even temperature by a cooling system, and usually have a throttle to regulate speed.

Industrial engines such as are used in excavators have a governor that automatically opens and closes the throttle to maintain proper speed.

Air Filter

Dust must be filtered out of air taken in by an engine to prevent it from wearing moving parts by scratching and grinding them and from building up gummy deposits by combining with the lubricating oil. Excavating machines work on dusty jobs so often that it is particularly important that they have good filters that are properly cared for.

The standard industrial air cleaner assembly includes a vertical intake pipe equipped with a dry pre-cleaner at the top and oil or wet-type cleaner at the bottom. One engine may have two or more intake pipes and cleaners.

The pre-cleaner takes in air from beneath and gives it a rotary motion by passing it over inclined vanes. The whirling air climbs around the intake pipe inside of the inner wall of a hollow case closed at the bottom, and at the top makes a sharp U-turn to get down the pipe. The spinning and the abrupt change of direction throw all the heavy particles against the outer wall of the case at the top, from where they settle down into the hollow in the case. A sight glass on one side permits the operator to see how much dirt has accumulated. When the line is about halfway up on the glass, he stops the engine, unscrews a wing nut on the holding bolt, removes a cap and then the outer case, and turns it upside down and shakes the dirt out of it. It is then replaced, with care that the gasket between the cap and the case is seating properly.

At the bottom of the pipe the air stream is turned sharply upward, blowing across the surface of an oil pool and through a maze of oil-covered wire. Particles remaining in the air after the first cleaning are caught by the oil. The oil reservoir should be cleaned and refilled and the filter mesh cleaned and re-oiled frequently.

If the oil level is low the velocity of the air going past it will be reduced, so that more dust particles are left for the filter, which will clog rapidly. If the oil is high, too much of it may be picked up in the air stream, and some might reach the engine. In diesels, the oil will burn in the cylinder.

Almost undetectable repairs in concrete... with FELKER Diamond Blades and Machines

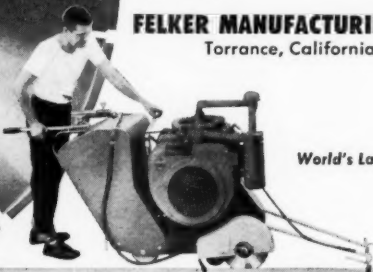


There's no need for rough broken edges, irregular patches, when making repairs in existing concrete. The modern method is pre-cutting to partial depth with Felker Segmented Diamond Blades before you break! Jobs go faster, are neater and savings offset cutting costs!

Felker supplies a wide range of diamond blade sizes, in types for cutting both green and cured concrete with maximum efficiency. Ask for price list and recommendations for lowest cost per cut!

FELKER CONCRETE CUTTING MACHINES—Made in sizes from 7½ h.p. through 36 h.p. for all jobs from patchwork to production cutting of control joints in highways, etc. Catalogs available. Write, specifying your requirements.

FELKER MANUFACTURING CO.
Torrance, California



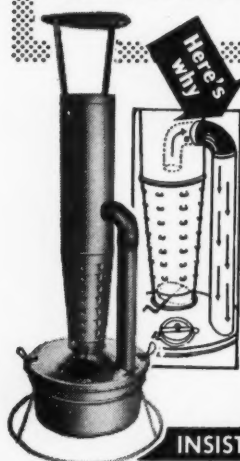
A typical patch resulting from broken edges; poorly bonded, ragged and unsightly. Vertical edges of cuts improve neatness, won't spall. Concrete fill, rather than asphalt, is unnoticeable.

World's Largest and Oldest Manufacturer of
Diamond Abrasive Cut-Off Blades and Machines.



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The most widely used Salamander for construction!



WHY HY-LO LEADS:

Patented Return Gas Principle
ends SMOKE... eliminates SOOT!

- Low first cost low operating cost.
- 70,000 to 140,000 BTU per hour!
- Burns only ½ to 1 gallon per hour of low cost fuel oil.
- One filling lasts 10 to 20 hours.
- Requires no skilled attendant.
- Lights with a match...easy to operate.
- Exclusive damper for quick extinguishing.
- Carrying handles for easy moving.

AVAILABLE IN ALL PRINCIPAL CITIES

INSIST on HY-LO Salamanders!

HY-LO's patented Return Gas Principle guarantees you a smokeless, clean-burning Salamander, requiring minimum care and attention. Nationally accepted, HY-LO's superior performance is the reason it is most widely used in the construction industry! HY-LO gives more clean heat per dollar invested than an other Salamander!



PRODUCTS CO.

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You Save Up to 50% When We REBUILD YOUR "CATERPILLAR" FINAL DRIVE HUBS



All work
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Yes! Up to 50%
can be saved
compared to the
cost of new hubs.
We also rebuild
worn flanges and
bolt holes . . .
And we pay rail
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For further information, contact your nearest
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BUTLER MACHINERY CO.

Caterpillar Dealer for Eastern North Dakota
Fargo, North Dakota

For more facts, circle No. 340

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ders and as its amount is not controlled by the governor, it may accelerate the engine beyond its rated speed and damage it seriously. A "runaway" can be stopped by shutting off the air supply by means of a valve that is usually part of the regular shut-off mechanism, or by putting the machine in high gear and stalling it with an overload.

High altitudes reduce the power of all internal combustion engines. This is because the air becomes less dense as height above sea level increases. The engine therefore draws in fewer molecules with each stroke, develops lower compression, and has less oxygen to combine with fuel. Two cycle engines suffer a smaller decline up to about 10,000 feet, because their blower feed packs more air in.

Installation of a supercharger on an engine to be used at high altitudes may restore or increase its sea level power. However, the same engine with the same supercharger would show increased power if taken down to sea level.

Engines to be used entirely at high altitudes should be specially constructed and adjusted.

Fuel

The standard fuel for industrial gasoline engines is of course gasoline.

This is usually the "regular" gasoline supplied for automobiles. It includes a small quantity of tetraethyl of lead, a poisonous compound that reduces tendency to knock, and/or other chemicals to improve performance; together with a dye to give warning of the poison, or to identify make or quality.

Gasoline is classified by octane rating. Octane is an excellent fuel in antiknock characteristics, and is given a 100 per cent rating. Heptane is a poor anti-knock fuel and is given a 0 per cent rating. The octane number of a gasoline is the octane percentage in a mixture of octane and heptane which it matches in anti-knock value.

Commercial range now is approximately 85 to 90 for regular gasoline with additives, 91 to 95 for premium quality, and 100 to 115 for aviation gasoline.

The treated and dyed gasolines are perfectly satisfactory in industrial engines that are used regularly. However, in machines that are seldom used, such as a compressor owned by a contractor who seldom blasts, or a pump with an owner who is lucky enough to do most of his work dry, gasoline evaporates in the carburetor and lines, leaving a gummy deposit that may interfere with starting and operation, and is a nuisance to remove. However, white gasoline may be very difficult to obtain.

The chief objection to "doped" gasolines on the job is that they are poisonous, and may be very irritating to the skin, so they should not be used to clean parts, and require special care in handling. The lead may enter the body through the skin or lungs and cause cumulative poisoning similar to painter's colic.

Leaded or doped gasoline cannot be used in engines equipped with the catalytic type of combination muffler

and exhaust scrubber.

Gasoline engines can also be run on compressed butane gas, and on various special fuels available in oil production centers. Special tanks, carburetors, and other equipment are needed.

The standard fuel for most diesel engines is fuel oil (diesel oil or diesel fuel oil), a petroleum distillate somewhat heavier in body and less inflammable than kerosene. It is almost non-volatile at ordinary temperatures. Commercial diesel fuel is usually No. 2 fuel oil.

Its ignition quality is rated by cetane number, and should be between

35 and 60. With varying amounts of adjustment and preparation, some diesels can burn much heavier fuels, even crude oil and the bunker C residue oils. Particular problems in handling these may include a heating device to make them fluid.

Many diesels cannot use kerosene or gasoline because they depend on fuel for lubrication of moving parts in the fuel system. Any of them may have trouble with gasoline due to pre-ignition, or vapor lock in the fuel lines.

In any grade of fuel the most important requirement is cleanliness. Many fuels contain sulphur and other

corrosive chemicals in sufficient quantity to damage pumps and injectors. Any of them will have more or less foreign matter that absolutely must be strained out, as the close fits in a diesel fuel system will not tolerate any solids. It is customary to have both primary and secondary filters, and often a final one at each injector.

Second grade fuel usually increases down time and maintenance expense.

Smoke

The diesel is normally a clean burning engine, as the cylinder is charged with more than enough air to burn the maximum amount of fuel in-

"Dairyland" contractor's big grader speeds U.S. 41 project

Safer winter driving for 24,000 vehicles daily

When there are two motor graders on a job and one is an Adams 660, invariably the tougher jobs are assigned to the big, powerful "660". Here's how a Milwaukee contractor divided the work on a recent Wisconsin highway improvement project:

Removed winter-driving hazard

Slippery pavement was a hazard to about 24,000 vehicles daily traveling on U.S. 41, just south of Milwaukee. Along 9½ miles of this busy 4-lane divided highway, the 45' median-strip was higher than the road. Snow could not be pushed far off the roadway. Melting snow drained across the highway, kept the pavement wet and slippery, often froze into glare-ice when the temperature dropped.

Wisconsin State Highway Commission awarded Stack Construction Co., Milwaukee, a contract to remove the high middle-ground, and provide proper drainage. For dirtmoving, contractor used 3 C Tournapulls and 2 "D"s, push-loaded by a rubber-tired Tournatractor. An Adams 660 and another grader did the blading.

Without interruption to busy highway traffic, Stack moved excess earth and cut a V-slope to provide drainage between traffic lanes. Contractor graded the island strip from road-shoulder height to 18" below grade at the center, and installed 12" feeders to carry surface water under the roadway to a drainage ditch.



Boiling-up a full blade-load of "buckshot" clay, Stack Construction Co.'s "660" grader cuts final sub-grade between north- and south-bound lanes on U.S. 41 south of Milwaukee, Wisconsin.

"660" handles heavier work

Stack Construction Co. assigned the big 8-speed Adams 660 grader to their big-volume dirtmoving "team". The 150 hp "660" used its extra-power to scarify hard-packed cross-overs. Working in the tough, dry, "buckshot" clay, the Adams assisted scrapers...plowed up windrows of dirt for partial self-loading of Tournapulls. And blading at speeds, sometimes as high as 4.7 mph in 3rd gear, "660" cut the final sub-grades before the installation of drainage pipes.

Contractor assigned the lighter finishing tasks—spreading and grading topsoil, backfilling, and surfacing shoulders—to its slower, 6-speed, medium-weight, 115 hp grader.

Finished ahead of schedule

Leonard Stahoski, Secretary and General Superintendent of Stack Construction Co., feels that the Adams motor grader helped put their Highway 41 job ahead of schedule. "The Adams is very powerful and maneuverable for its size," says Mr. Stahoski. He adds, "This '660' has done everything asked of it, keeping our jobs on schedule."

The main reason why

Whether it's a "660" or any other Adams heavy-duty grader, the Adams

is usually given tougher work. That's because only Adams has 15 speeds... 8 forward, 4 reverse, 3 optional creeper speeds. Compared to competitively priced graders, all heavy-duty Adams machines have more power-speed combinations...deliver more horsepower through anti-friction drivetrain...provide more usable push-power on the blade.

On models 660 to 330, the Adams transmission gives you higher reverse speeds (12.2 to 13.7 mph) and faster road speeds (23.3 to 26.0 mph), which cut non-productive travel and shuttle time to the barest minimum. As a result, Adams helps you get more work done, speeds blading, increases productivity of other machines... pays you a bigger return on your investment in grading machinery.

See Adams graders in action:

Call or write us, and ask to see an Adams motor grader at work. See for yourself why Stack Construction Co. and other leading contractors select Adams for their really tough jobs. Choose from 6 grader models:

New POWER-Flow 660... 190 hp with torque converter...30,200 lbs.
Model 660... 150 hp...30,050 lbs.
Model 550... 123 hp...26,370 lbs.
Model 440... 104 hp...24,080 lbs.
Model 330... 80 hp...23,020 lbs.
Model 220... 60 hp...15,500 lbs.
(Weights shown are usual working weights)

Adams, POWER-Flow—Trademark, Tournapull, Tournatractor—Trademark Reg. U.S. Pat. Off. AG-30-H-b-6



LeTourneau-WESTINGHOUSE Company, PEORIA, ILLINOIS
A Subsidiary of Westinghouse Air Brake Company

ARBA



See you at the ROAD SHOW • Chicago • January 28-February 2, 1957

For more facts, use Reader-Reply Card opposite page 18 and circle No. 341

jected. It has a big advantage over gas engines in that the exhaust is almost free from carbon monoxide. However, it does exhaust some bad-smelling, irritating and moderately toxic gases that prohibit its use in poorly ventilated places unless an efficient exhaust scrubber is attached.

In view of the generally clean-burning characteristics of diesel fuel, it is unfortunate that so many diesel trucks trail clouds of black smoke behind them, to the annoyance of everyone on or near the highway. This nuisance is caused by injecting more fuel than the engine is designed to use, so that the mixture is too rich.

Excavating machines and off-the-road haulers almost never show black exhaust smoke, while all too many highway trucks put on a good imita-

tion of a coal burning locomotive firing up. Smoking is an indication of fuel being wasted, oil being contaminated with sludge, and exhaust valves and mufflers being damaged by contact with still-burning gases. For this reason, any alert foreman or operator will send for a service man if he sees a dirty exhaust.

Some of the smoky exhausts seen on highways indicate defective parts or adjustments which will be fixed at the next service stop. Most of them, however, are a result of a driver or mechanic "souping up" or "hot-rod-ding" the engine by tampering with injectors or pumps, or replacing them with oversize ones designed for different service. Some increase in acceleration or power may be obtained, as the hydrogen in the fuel gets more Btu's out of the available oxygen than the carbon can, but the wasted fuel, damage to the engine, and nuisance to the public far outweigh this advantage.

If a diesel has any tendency to smoke, it will do so at wide open throttle, and particularly when lugged down below its normal operating speed. Since the same quantity of air is drawn into the cylinder regardless of throttle setting, it follows that the mixture becomes richer as the throttle is opened and more fuel is injected. At below-normal speeds, the slower piston stroke allows a considerable part of the heat of compression to be absorbed by the cylinder walls, and the resulting lower temperature flame does not use as much of the available oxygen as at higher speeds.

Starting

Diesel engines are started by cranking in much the manner of gasoline engines. However, since they depend on heat for ignition, cold starting presents a special problem. Hand cranking is impossible unless some device to relieve compression is used, and is impractical in any case.

Unit injection engines usually are cranked by an electric starter motor, powered by batteries. Voltages range from 12 to 32 or more. Motors are usually so constructed that they should not be used continuously for over 30 seconds, after which they need a minute or two to cool off. This is an unfortunate weakness, as whatever heat has been generated in the engine dissipates during this period.

Electric-cranked engines usually need some help to start when temperatures are below freezing. This is particularly so if they are worn so that compression is poor.

The cold-starting device that appears to be most popular (with manufacturers at least) is injection of ether starting fluid into the intake passage. A dispenser or primer pump is mounted on the dash and connected by very fine tubing to a hole drilled in the intake. The pump chamber may be filled by pouring ether from a can, or by puncturing an ether capsule inserted in it.

The pump handle is operated while the starter is used, so that vapor from the highly volatile ether is carried into the combustion chamber. It has a much lower flash point than

fuel oil, and so will be fired by compression at a comparatively low temperature, igniting the injected fuel oil and turning the engine.

One difficulty with this device is the nuisance of getting, keeping, and using the ether. The capsules are preferable, as loss from leakage and danger of explosion are less. This fluid is so volatile and so flammable that it cannot even be stored in some localities, and it must be kept well away from heat, flame, and sparks.

Another trouble is that the tubing is so fine that it is easily damaged by vibration or accident, or closed by accidental pinching. The pump may not work properly. The tube may have drained so that by the time fresh ether from the pump reaches the air passage, a low battery may have de-

livered its last kick. Better average results are obtained by lifting the pre-cleaner body off the intake pipe, replacing the cleaner, then cranking the engine.

A preheater is often supplied for cold weather diesel starting. This may resemble a miniature furnace-type oil burner inside the intake passage. There is a spark plug, a nozzle, and a dashboard hand pump. The spark is switched on, fuel is forced out the nozzle and is ignited, and the engine is turned with the starter. The burner heats the air going into the cylinders. It consumes some oxygen, but usually not enough to interfere with combustion in the cylinders. The principal drawback is that mechanical difficulties, particularly shorting out the plug with fuel oil, and failure of the

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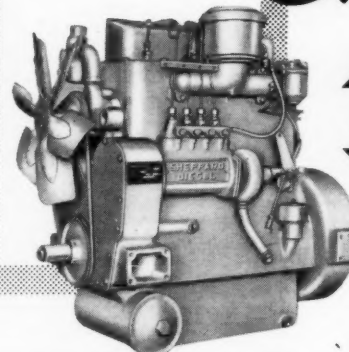
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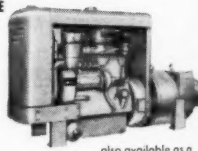
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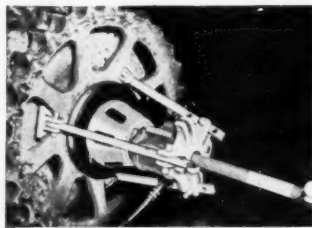
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CONTRACTORS AND ENGINEERS

pump to operate, may prevent it from working when most needed.

Some preheater effect can be obtained by removing the pre-cleaner and directing the flame of a blowtorch down the intake pipe while cranking. The long distance to the cylinders causes the loss of a large part of this heat, but effects are usually good. (Note: don't ever do this with a gasoline engine, as it not only is dangerous, but it wets the spark plugs with condensation.)

Ether and a preheater must never be used at the same time, as a serious explosion in the intake passage may result.

Many diesels, particularly those with precombustion chambers, must be started by an auxiliary gasoline engine. This is mounted next to the diesel, and drives it through a clutch and gears. The clutch is disengaged, the gas engine started by hand cranking or preferably with an electric starter, and run until it is warm. Cooling systems may be connected so that it warms the diesel at the same time.

The drive gears are then meshed and the clutch engaged, so that the diesel is turned over by the gas engine. It is customary to have a "start" position on the throttle, that will admit air but will not supply fuel. This permits smooth warming up without danger of running fast enough to damage the kicker engine. Finally the throttle is moved to operating position, and the clutch and/or gears disengaged.

This reduces the problem of starting the diesel to one of starting the kicker engine, but unfortunately this is often difficult. One precaution is to stop it by shutting off the fuel, rather than the ignition, so that gasoline will not be left in the carburetor and lines where it will evaporate and leave residues of lead, dyes, and other foreign materials. White gas, if obtainable, is to be greatly preferred even with this precaution.

Controls for use of the auxiliary engine may be complicated and confusing, so that sometimes it is left connected and is severely damaged by over-speeding when the diesel is revved up. An over-running clutch or a starter-type drive would avoid this danger.

One diesel is equipped with a carburetor through which the intake air can be diverted. An extra chamber with a spark plug can be connected to the main combustion chamber by opening a valve, or shut off from it by closing it.

To start cold, a change-over lever is moved to starting position, opening the auxiliary chamber to reduce compression to $6\frac{1}{2}$ to 1, route air through the carburetor, and turn on the ignition. The engine is then started in the conventional manner by using choke and starter. It is run long enough to warm up the cylinders; the lever moved to shift to diesel operation, and the diesel throttle opened to the desired setting.

Many engines seem to start best when turned over by rolling, pushing, or pulling the machine rather than by using a starter. It is a very good plan

to leave equipment in such position that it can be readily towed if necessary, as this may save hours of monkeying around with adjustments that might better be left for a slack time. Coasting down hill is a good means of starting, and a crawler machine may be backed up a steep pile, and started next day on a run of a few feet.

One of the few disadvantages to the increasing use of torque converters in tractors and trucks is that the slippage makes them difficult or impossible to start by towing. For cold climate use, the installation of a lockup clutch to allow solid drive might be justified on this ground alone.

In freezing weather a small quantity of alcohol, 188 or 200 proof, should be put in the fuel tank daily.

This prevents water from freezing in the lines, and enables some of it to mix with the fuel and go through the filters and engine without causing trouble. The tank should be filled at the end of the day to keep condensation at a minimum.

Oil drag

There are four factors that make cold weather starting difficult—the extra heat required to raise fuel-air mixtures to the ignition point, the slower vaporization of fuel (particularly important with gasoline), the drag of thick cold oil on all parts, and the lowered efficiency of cold batteries.

The oil drag can be very serious. In general, thinner oils should be used in cold than in warm weather, both to

reduce drag and to supply better lubrication. If conditions are severe, or particular machines are hard-starting, it is a good plan to put a small quantity of gasoline, one or two cups, in the crankcase oil filter tube just before shutting down. The engine should be turned over afterward just enough to mix the oil and gas in all its parts.

This will thin the oil so that drag will be greatly reduced the next morning. As soon as the engine warms up, the gasoline will evaporate rapidly, returning the oil to its proper viscosity. The gas vapor will escape through the crankcase breather pipe, and if it has a filter element in it, danger of fire from this source is negligible.

The problems of starting gasoline engines are well known. However,



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there is one excellent trick that has not received the publicity it deserves.

Difficulty in starting, and even stalling out of engines that are running can be caused by moisture inside the distributor cap. This moisture may be water that leaks in, or that condenses like dew on the inside because of atmospheric conditions or because of the outside of the cap being chilled by splashed water.

A little tetrachloride (used in Pyrene fire extinguishers and as a non-explosive dry cleaning fluid) will immediately separate the water from the cap and float it. The fluid can be dumped out, the cap replaced immediately, and the engine will start unless it suffers from other ailments.

Gasoline can be used in the same way, but it is not as efficient, and

must be dried out before replacing the cap, to avoid danger of explosion.

Spark plugs and ignition wires can be dried quickly with carbon tetrachloride from a fire extinguisher.

Boosters

A battery charger is a good investment for a contractor, particularly in cold climates.

Small trickle charges or boosters for 6 or 12 volts can be bought for less than \$20 in auto supply and mail order stores. Maximum charging rates are 4 to 10 amps, so that several hours are required to produce results. They are used chiefly for overnight and idle-time day charging. No damage is done by leaving them on after the battery is charged.

Service station type units with out-

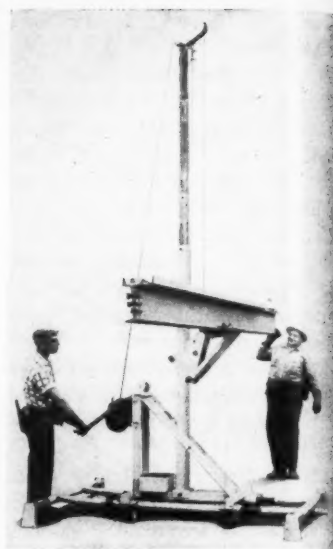
put sufficient for quick charging cost \$50 or more, but will easily repay their cost on many jobs.

High voltage systems usually have two or more 12-volt batteries which can be detached and charged separately.

A booster cable set is made up of two insulated heavy wires similar to battery cables, which have clamps at each end. They can carry current from a good battery to the connections on a weak one, without removing either from the machine.

One wire connects the two positive battery terminals, the other the two negatives. Both batteries should be the same voltage rating. They work together to turn the starter. As soon as the engine runs the booster cables are removed.

THE END



The one-ton-capacity Blue Ox erection pole can be bolted to a truck bed or fitted with an auxiliary table to convert it into an elevator.

Portable erection pole has capacity of one ton

A portable erection pole with a capacity of one ton is available from the Broad Crane & Engineering Service Co. The Blue Ox erection pole can be used for loading and unloading heavy or bulky materials, erection of structural steel and other materials, and moving or spotting equipment and machinery.

Three telescoping steel tubes provide a boom adjustable between 9 and 20 feet in 4-inch increments. The standard 2-speed, one-ton hand winch is equipped with 60 feet of 3/4-inch steel cable. Provision is made for single, double, and triple-strand operation for various loads.

The heavy welded steel frame is equipped with swivel casters for easy maneuverability, and with an outrigger base for stability when lifting heavy loads. The base may be bolted to a truck bed. An auxiliary table, supplied with the Blue Ox, converts it to an elevator.

For further information write to the Broad Crane and Engineering Service Co., 779 S. Dumfries, Detroit 17, Mich., or use the Request Card at page 18. Circle No. 120.

Torque converter

Torque-converter-drive crawler tractors are discussed in a pamphlet from the Allis-Chalmers Mfg. Co. According to the pamphlet, the torque converter parts—the impeller, turbine, and housing—automatically increase torque up to 4 1/2 times. All three parts of the conveyor are pictured.

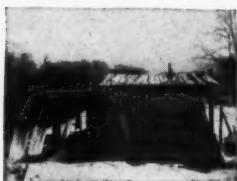
To obtain Bulletin No. MS-1140 write to the Allis-Chalmers Mfg. Co., Box 512, Milwaukee 1, Wis., or use the Request Card at page 18. Circle No. 2.

Minneapolis-Moline names

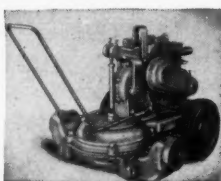
Stephen K. Plasman has been named market research manager of the Minneapolis-Moline Co. of Minneapolis, Minn. In his new position, Plasman will look for new markets to absorb the manufacturing potential of his company.



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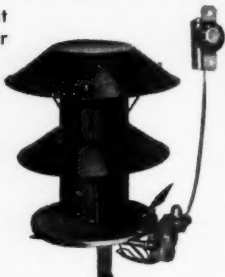
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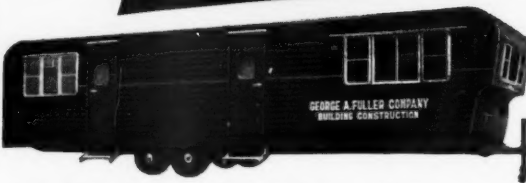
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A PAIR of Econmobiles pour concrete on a section of the retaining wall for the

new Air Force Academy near Colorado Springs, Colo. The rigs are two of the three purchased by the Long Construction Co., Colorado Springs, for use on the project. The third is generally utilized to deliver form sections from the stockpiles to the retaining wall sites. According to the manufacturer, one Econmobile is handling five ready-mix trucks in the same time that a crane also being used on the pouring operation is handling four trucks. For more details on the Econmobiles write to the American Road Equipment Co., 4302 N. 28th St., Omaha 11, Neb., or use the Request Card at page 18. Circle No. 89.

HRB issues two bulletins on parking and business

The Highway Research Board has issued two bulletins, "Parking and Buying Habits of a Store's Customers" and "Parking and Its Relationships to Business". The first bulletin reports on the findings of research done in connection with shoppers' parking habits in Lexington, Ky.

The second bulletin, "Parking and Its Relationships to Business", presents data on the parking problem, and shopping travel patterns.

Both bulletins, each priced at 60 cents, may be obtained from the Highway Research Board, 2101 Constitution Ave., Washington 25, D. C.

Geer Technical Institute opens earthmoving school

Geer, Technical Institute, Chicago, Ill., has opened an earthmoving school in Braidwood, Ill., to teach men to operate earthmoving and motor-truck equipment.

The three courses planned will in-

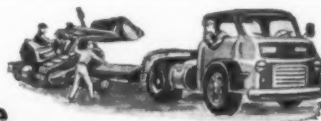
clude a certain amount of theory and this will be supplemented by the actual working of the equipment. All machinery used in the course is manufactured by the International Harvester Co.

Patten Tractor news

Roy D. Parmley has been appointed sales representative for the Industrial Power Division of Patten Tractor &

Equipment Co. of Bellwood, Ill. Parmley will specialize in repowering construction equipment, and in the installation of prime power, standby power, and diesel electric sets.

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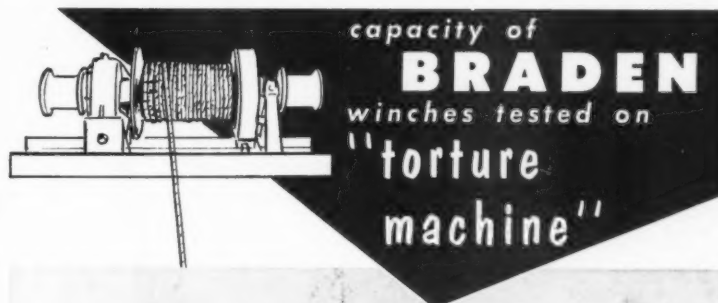
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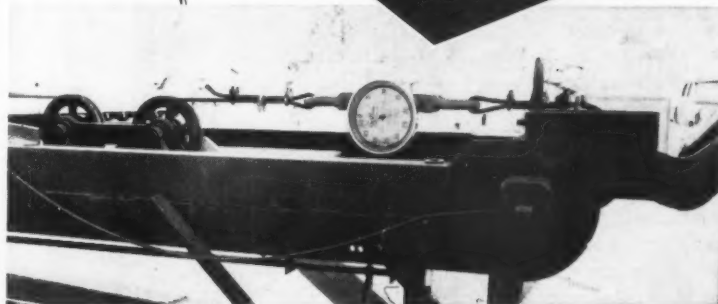
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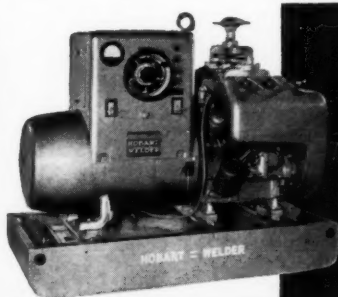
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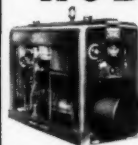
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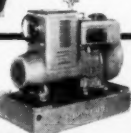
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labor review

With approximately 50 per cent of the work force on the St. Lawrence Seaway and Power Project coming from the areas in which the construction is taking place, and with a substantial portion of these local employees trying their hand at construction work for the first time in their lives, the myriad problems of safety assume extreme proportions. It is a tribute to the parties involved in the project that the job has earned the reputation throughout the construction field as being a safe one.

In many respects, the safety program that has been set up throughout the St. Lawrence Project is unique. A staff of nine experienced safety engineers is at work on a full-time basis, working in shifts around the clock to maintain and even improve a record that must be envied. Every one of the engineers has spent at least a dozen years in the field of safety. Each has a college degree as a civil or mechanical engineer.

The results of the efforts these men have put into their jobs has been an injury-frequency rate of only 19.7 lost-time injuries for every million man-hours worked. This compares remarkably well with the figure of the National Safety Council for the heavy construction field in the entire United States. Throughout the nation, according to the NSC, the injury-frequency rate is 35.61 lost-time injuries for every million man-hours worked, almost twice as high as the St. Lawrence rate.

The injury-frequency rate does not tell the entire story, either. To get a true picture, it must be remembered that the so-called "steadies" on the St. Lawrence Project—heavy construction workers who earn their livings by following jobs from state to state—have already been educated to the value of safety-consciousness from many years of experience and observation. The safety engineers, who have not broken down the figures completely, are of the opinion that the injury-frequency rate among the old hands is actually about half the rate for all the workers on the job.

Every industry or profession develops its share of superstitions through the years, and the construction field is no exception. One of these superstitions, one that seems to be popular in many different fields was borne out late last winter when a female visitor to the St. Lawrence Project innocently stopped to pass the time of day with one of the workers. As far as construction workers are concerned, the fairer sex is strictly taboo around their jobs. According to the superstition, a woman on the job means an accident to one of the workers.

The lady's presence upset the men and there was an undercurrent of talk about walking off the job for the rest of the day. Finally, after some highly persuasive appeals, the men were prevailed upon to remain. Before the end of the shift, the leg of one of the

workers was crushed in a freak accident and had to be amputated.

The Chief Safety Engineer on the waterway and power job, Thomas J. Laskowski, is very cognizant of the superstitions of the men and has a healthy regard for the effects of these beliefs. Laskowski subscribes to the theory that "safety is a psychological selling job". The accident that followed the appearance of the woman, Laskowski asserts, was the result of the men becoming exceptionally accident-prone because one of their superstitions had been violated. The

woman's presence caused the men to expect an accident and, fatalistically, they neglected to observe the usual, normal safety precautions, making an accident almost inevitable.

Despite the fact that every contract awarded on the St. Lawrence Project has built-in safety specifications written in accordance with state and federal laws, there is an ever-constant possibility that the injury rate will soar suddenly. Mr. Laskowski has warned. According to the "Industrial Bulletin", the New York State Department of Labor's monthly news

magazine, an analysis of accident case histories will bear out his contention that most mishaps are the result of human rather than mechanical error. A proper awareness of safety and the proper attitude toward it is a difficult thing to write into a contract.

Laskowski makes no bones about being very apprehensive of the attitude—or the lack of it—toward safety on the part of many of the local workers. Because their jobs are temporary and because they are, for the most part, ignorant of the consequences they might have to pay for



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flaunting safety precautions, they consider on-the-job safety practices as a lark.

To back up his contentions, Laslowski points to the four fatalities that have been registered thus far in connection with the work on the St. Lawrence Project. Thorough investigations of the deaths definitely ascertained that three of them came about because normal safety procedures had been ignored. Even in the fourth fatality there is still some doubt as to whether the accident might not have been prevented if there had been a

routine check of the earth which the tractor involved in the mishap was overturning.

Just what is the staff of safety engineers doing to pull the already enviable St. Lawrence injury-frequency rate even lower? Education through every available medium of communication and constant checking, rechecking, and checking again of the procedures employed on the project are the answers, according to the "Industrial Bulletin". Frequent meetings with union business agents have been held by the safety engi-

neers to convince them that their men must be made more safety conscious.

Every available means of communication is used unsparingly to make "Be Careful" the employees' way of life. Frequently, the New York State Department of Labor's safety inspection force is called in to advise and help the safety engineers cope with special problems. This is in addition to the regular inspections made by the Department of Labor's Division of Industrial Safety Service.

Everyone, visitor or worker, must wear a hard hat at the project site.

Special precautions have been taken to control blasting operations which, along with excavation, are said to be the two most dangerous phases of dam building.

Heavy construction is inherently dangerous. Mr. Laskowski, speaking for all the safety engineers on the project, has declared, "You always strive for a perfect safety record and never achieve it. Our job is to get the injury-frequency rate down to the lowest possible level and then to keep it there."

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TRICAGO



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Line of generator sets

■ The Detroit Diesel Engine Division of General Motors Corp. has issued a catalog outlining its complete line of electric generator sets. Radiator and heat-exchanger-cooled models ranging from 20 to 245 kw are illustrated and described. Data is also given on 50 and 60-cycle direct-current units for emergency standby operation and continuous off-the-line use. Specifications accompany each model. The design and construction of the generators are detailed, and optional equipment is listed.

To obtain the catalog write to the Detroit Diesel Engine Division, General Motors Corp., 13400 W. Outer Drive, Detroit 28, Mich., or use the Request Card at page 18. Circle No. 47.

Year book for architects has seventh revision

"Architects' Year Book (No. 7)", edited by Trevor Dannatt, is the seventh revision of the book. The book attempts to cover a wide range of current architectural or related activities, and includes chapters on theory, structure, planning, and building techniques and components of international structures.

The book discusses town planning, developments abroad, exhibitions and design, the current architecture in Great Britain, and a criticism of the work of Auguste Perret and Gardella. Much of the material is supplemented by architects' plans, diagrams, and pictures.

Priced at \$10, the book is available from the publisher, Philosophical Library, Inc., 15 E. 40th St., New York 16, N. Y.

Cummins Engine news

The Cummins Engine Co., Inc., Columbus, Ind., has announced that certain assets of the Cummins Diesel Sales Corp. of Charleston, W. Va., have been sold to a new firm, Cummins Engines of West Virginia, Inc., also of Charleston. President of the new corporation is L. E. Williams.

Cummins Engines of West Virginia, located at 1607-09 Kanawa Blvd. W., will cover Tazewell and Buchanan counties in Virginia, and all but ten counties in West Virginia.

Weather charts

The weather outlook for January

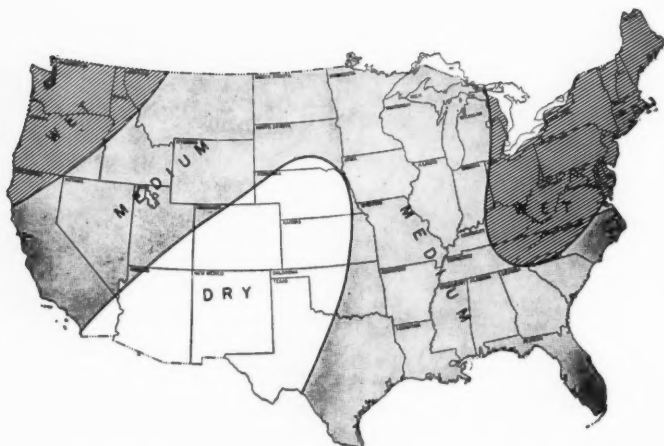


Chart I—Precipitation

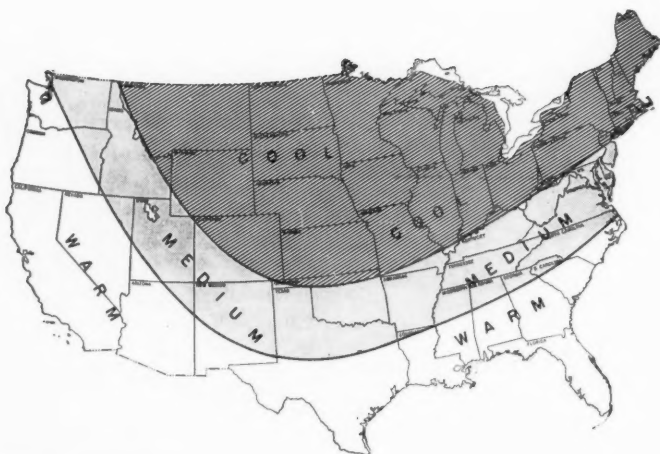


Chart II—Temperature

The accompanying maps indicate the average weather conditions to be expected throughout the United States in January, 1957. Chart I classifies precipitation, and Chart II indicates relative temperatures throughout the nation.

Dry areas, designated on Chart I, will average less than six days of precipitation. Areas marked medium will have between six and 12 days with precipitation; and wet areas will have more than 12 days of precipitation.

Warm areas, indicated on Chart II, will experience less than 10 days with minimum temperatures of 32 degrees or lower. Between 10 and 22 such days can be expected in medium areas, and cool areas will average over 22 days of freezing temperatures.

The charts can also be used in a relative sense. For example, western

Tennessee will have fewer days with precipitation than will the eastern part of that state, while Illinois, on the average, will have the same number of days with precipitation as Alabama. It can also be noted on the temperature chart that southeastern North Carolina on the average will have a lesser number of freezing days than will northern Alabama or northern Mississippi.

Prepared for CONTRACTORS AND ENGINEERS by the Weather Corp. of America, 39 Broadway, New York, N. Y., and 611 Olive St., St. Louis, Mo., the charts indicate average conditions and are not intended as specific forecasts. However, Weather Corp. of America will answer readers' questions regarding the applied uses of meteorology or climatology to the construction industry. THE END

A vibrating mechanism that produces a dynamic thrust of 3,000 pounds 40 times per second gives this 1½-ton Vibrapac the compaction ability of deadweight rollers weighing from 8 to 10 tons, according to the manufacturer.



Roller employs vibration instead of static weight

A power roller that uses vibration instead of static weight to effect compaction is announced by Rolcor Industries. Weighing 1½ tons, the Vibrapac will produce the same compaction density as deadweight rollers weighing from 8 to 10 tons, the manufacturer reports.

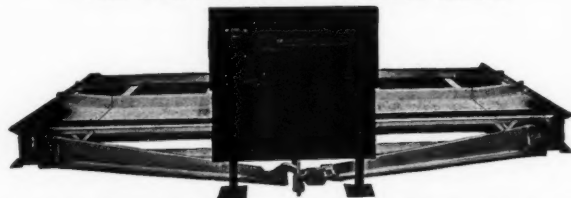
The vibrating mechanism, consisting of eccentrically weighted parallel shafts, 3 feet long and mounted on self-aligning bearings, is said to produce a dynamic thrust of 3,000 pounds

40 times per second. Ground vibrations are controlled in direction and can be felt within a variable radius of 24 feet, the company advises.

Tests by the manufacturer report that densities of 105 on sand fills and 136.8 on high-type hot-mix asphalt are easily accomplished.

For further information write to Rolcor Industries, 1208 Second Ave., Minneapolis 3, Minn., or use the Request Card that is bound in at page 18. Circle No. 55.

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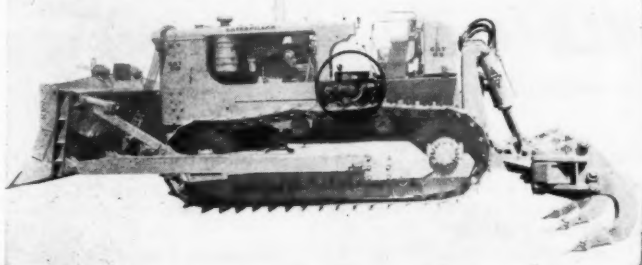
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CONTRACTORS AND ENGINEERS

The Ateco direct-drive pump, mounted at the Cat D9 engine power takeoff, provides constant power to raise and lower the Ateco rock ripper independently of the clutch or torque converter.



Pump maintains pressure for ripper attachment

■ Designed to maintain constant hydraulic control pressure, a new direct-drive Ateco pump for the Ateco tractor-mounted rock ripper is also available for the Cat D9 crawler tractor. The pump and ripper are manufactured by the American Tractor Equipment Corp.

The pump is mounted at the engine power takeoff just ahead of the clutch and transmission assembly, where it receives constant power while the engine is running. Hydraulic control pressure is thus maintained without interruptions due to clutch action or speed reduction through the torque

converter.

Use of flexible rather than rigid high-pressure lines is said to eliminate joint leakage due to vibration and to permit easy access to the tractor clutch assembly without disassembly. The Ateco pump is offered optionally on all new HR-D9 rock rippers; a conversion kit is available for HR-D9 units already in use.

For further information write to the American Tractor Equipment Corp., 9131 San Leandro Blvd., Oakland 3, Calif., or use the Request Card that is bound in at page 18 of this issue. Circle No. 124.

Diesel air compressor gives low-cost service



■ Only four cents worth of fuel per 1,000 cubic feet of compressed air delivered is reported for the JW-78 diesel

air compressor available from the JJW Division of Cerlist Diesel, Inc. The unit is rated at 78 cfm, 100 psig.

Available as a portable model with two rubber-tire wheels and a drawbar or as a stationary model for mounting on a truck bed or other foundation, the JW-78 has a horizontal, single-cylinder diesel engine built at a right angle to the single compressor cylinder. The two cylinders share a common crankcase and have a single, forged steel crankshaft. According to the company, the cylinder arrangement balances the rotating forces and practically eliminates vibration.

For further information write to the JW Division, Cerlist Diesel, Inc., Burlington, N. C., or use the Request Card at page 18. Circle No. 119.

Polish technicians study U. S. construction

A 5-man team of Poland's leading construction experts is studying housing and building development in this country. The party, headed by Prof. Czeslaw Babinski, Deputy Minister of Building, arrived November 18 in New York City. The remainder of the group consists of Dr. Juliusz Gorynski, Director of the Building Institute in Warsaw; Walery Iwanowski, Department Director in the Building Ministry; Wladyslaw Podwapinski, Building Ministry architect; and Prof. Wacław Zenczykowski of the Polish Academy of Sciences.

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WORKMEN ATTACH HERC-ALLOY sling chain to a wood piling in preparation for removing it. When a special high-strength alloy chain assembly was needed to remove old wood piling at this upstate New York building site, the McLain Construction Corp. and the Horton Pile Driving Co. turned to Herc-Alloy and Hammerlok alloy steel links, one of which can be seen where the chain joins the master link. According to the manufacturer, the Columbus McKinnon Chain Corp., the use of the Hammerlok links enables anyone who can drive a nail to assemble or rebuild a sling chain in minutes. No peening or welding is required. For further information on the chain and the links circle No. 88 on the attached Request Card or write to the Columbus McKinnon Corp. of Tonawanda, New York.



Steel buildings and accessories shown in catalog

■ Stran-Steel Corp.'s line of industrial and commercial buildings and accessories is featured in a color catalog from the company. Rigid frame structures, bowstring truss buildings, and Stran-Satin metal walls are discussed. Information is included on Stran-Lite translucent,

reinforced, plastic sheets of rib design. Pictures, diagrams, and architectural drawings accompany the data presented.

To obtain the catalog write to the Stran-Steel Corp., Ecorse, Detroit 29, Mich., or use the Request Card at page 18. Circle No. 26.

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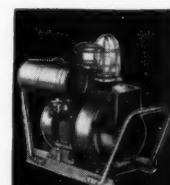
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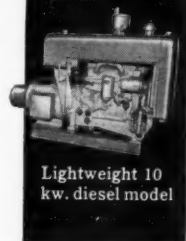
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Surveying Washington

by HUBERT KELLEY, Jr.

As the new roadbuilding program picks up speed, Secretary of Labor James P. Mitchell warns that the department will be on the alert for violations of federal wage and hour laws covering those engaged in work on interstate highways.

He stated, in unusually emphatic terms, that the Fair Labor Standards, Davis-Bacon, and Walsh-Healy acts will be enforced "to the hilt", adding that the "men who build the new federal highways and the bridges, viaducts, and tunnels connected with

them will be afforded the full protection of the law, with positively no exceptions."

The Fair Labor Standards Act, providing for a minimum wage of \$1 an hour and time and a half overtime pay for any hours worked in excess of 40 per week, was construed as applicable to workers on interstate federal-aid road projects by virtue of a Supreme Court decision. The ruling sustained the Labor Department's contention, in a case pertaining to a lock and canal, that workers engaged in

constructing improvements to an interstate instrumentality should be covered by the wage and hour law.

Secretary Mitchell indicated he was not particularly worried about compliance with the \$1 minimum by highway contractors because there are few sections of the country where that low a wage is paid. He said his primary concern was to assure that highway workers are compensated at not less than the typical prevailing rate in the locale where they are employed, in accordance with the Davis-

Bacon provision that was written into the Highway Act of 1956.

Mr. Mitchell pointed out that it is his job to find the prevailing rates and that the department's wage determination division is being enlarged, top legal talent being recruited to gather the information. He stated that the wage determination procedure has been explained in detail to every state highway department and to industry, with 163 determinations having been already made.

"Blacklist" actions against contractors under the Davis-Bacon Act have numbered only four over its 17-year history from 1935 through 1952, according to Secretary Mitchell. But, he added, since 1953 there have been no less than 114 actions involving 50 firms and 64 individuals.

"Blacklisting" refers to the power of the secretary to ban for three years from bidding on government contracts any contractor who is found to be violating the wage and working provisions set forth in the act.

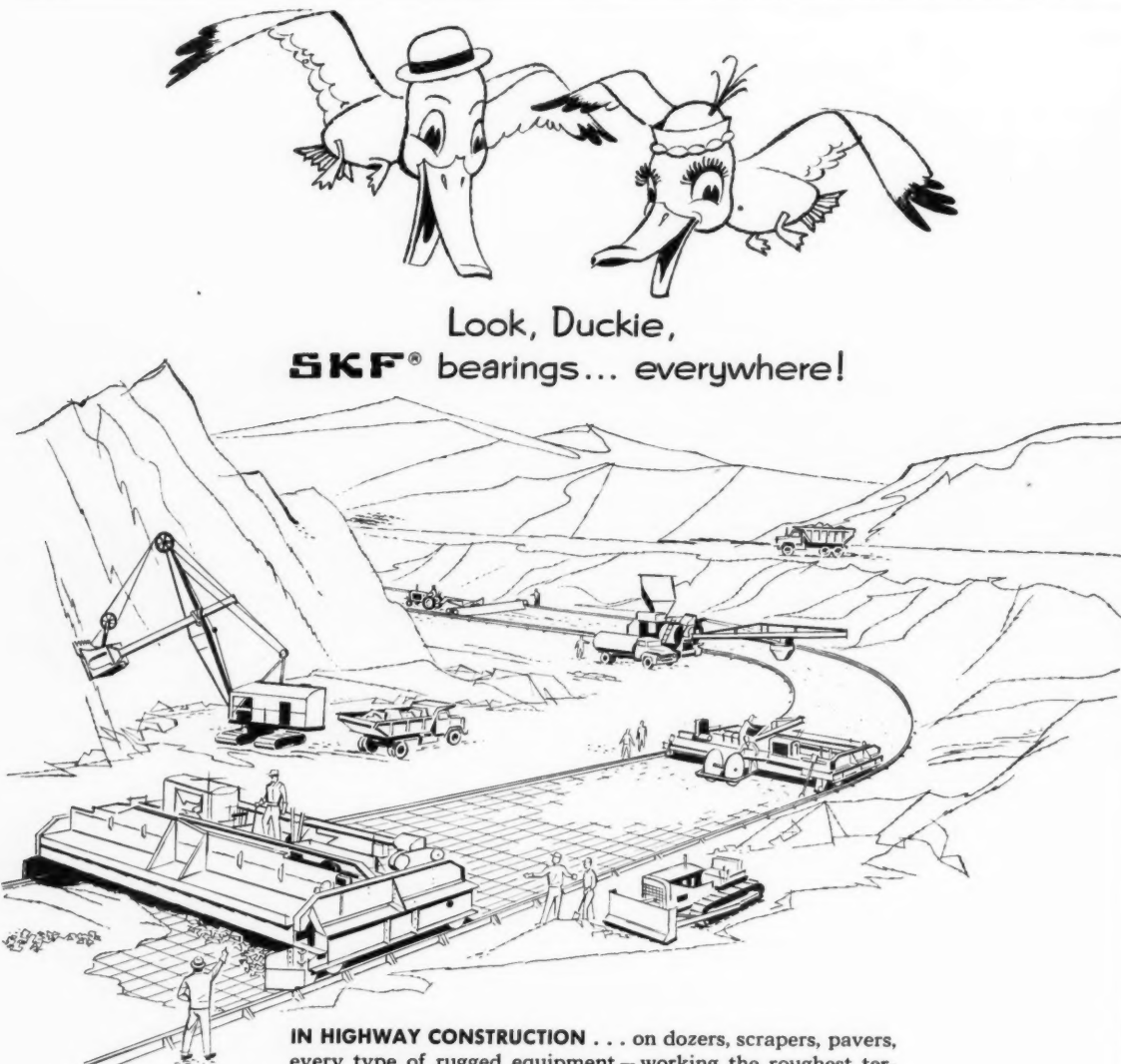
Mr. Mitchell declared that he is serving notice on the "chiseling contractor"; that he intends "to make the Davis-Bacon Act do its job" of protecting workers and "fair employers" against low standards and unfair competition resulting from low wages. The rights of every worker, he vowed, will be safeguarded "on every mile of the 41,000 miles of our new interstate highway system."

In another statement related to the constructing industry, the secretary said that at the direction of the President he is forming a committee to hammer out "specific recommendations" for amending the Taft-Hartley Act's application to the building and construction trades. The committee will be composed of representatives of industry and the AFL-CIO building trades department.

He stated that he would call the committee into session before the first of next month. He gave no indication of just what amendments the group would take up other than saying it would deal with "special problems" in the law's application to the industry.

Slum clearance has been aided considerably since Congress passed Title 1, which introduced the principle that federal aid to municipalities for slum clearance was essential if progressive deterioration of cities was to be checked. In this span, according to the latest government statistics, 232 municipalities have received financial grants under the Title 1 authority for 375 separate projects.

In passing the Housing Act of 1949, with its Title 1 provision, Congress authorized \$500 million in slum clearance aid. By the middle of 1955 cities had gobbled up almost the entire amount, leading to new legislation increasing the authorization to \$1 billion. At the end of fiscal 1956 over \$650 million of the new total had been already committed.



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The Housing Act of 1954 supplemented the slum clearance program with the broader approach of urban renewal. Urban renewal had its genesis in the feeling that clearing slums after they had developed was somewhat akin to closing the barn door after the horse had wandered off. The new program, therefore, was aimed at preventing slum formation through the grant of federal funds for rehabilitating deteriorating areas before they reached the hopeless stage.

Harried city officials, whatever their doubts about encroachments from Washington, in many instances have had little option but to ask for federal aid. With inadequate local sources of revenue, they faced a choice of turning to Washington or waging a losing fight against the spread of blighted neighborhoods.

According to the Labor Department, 106 communities drew up approved workable programs under the urban renewal law as of mid-1956, and another 86 had such programs in the pending stage.

Almost every big city has been forced to request assistance, with New York City, Chicago, and Philadelphia leading the way with 16, 14, and 8 approved programs, respectively. Of the top 20 metropolitan centers of population, only Seattle and Houston had not participated in any federal-aid projects as of the beginning of this year.

While the big cities naturally face the most acute slum headaches, urban renewal is a problem everywhere. The Labor Department reports that of 340 slum clearance and urban renewal projects under way this year over one-third were in communities under 50,000; 95 were in communities under 25,000; and 42 were in centers of less than 10,000 population.

The South is pointed to as the principal example of small-town participation in the federal redevelopment program. In Tennessee alone, the government says, seven cities of under 10,000 population were engaged in urban renewal. The group was said to include Waverly, a hamlet where the inhabitants number less than 2,000.

Home builders appear pessimistic about the 1957 outlook. They expect fewer starts and higher price tags on the units that are constructed, chiefly because of rising costs and the tight credit supply.

A survey by the National Association of Home Builders, headquartered in Washington, indicates that a majority of its members feel new housing starts will decline below the expected 1956 rate of 1,150,000. Many expect a 10 per cent slump, with other builders predicting a more drastic fall to 800,000—unless mortgage credit eases. Half of those polled, however, not only expect that the loan market will stay tight but will become even more pinched next spring.

In conferences with government of-

ficials builders have strongly emphasized that the unavailability of credit which followed hiking of discount rates by the Federal Reserve Board has slowed construction activity everywhere, and that major policy reversals are desperately needed. They contend that the Administration's action in slicing down payments from 7 to 5 per cent on FHA-insured mortgages on homes of \$9,000 or less is inadequate because relatively few homes can be built at that price, one reason being that credit is so difficult to ob-

tain. They add that the median price of the 1957 home is likely to be around \$15,000.

Housing Administrator Albert M. Cole concedes that housing starts are down across the nation because credit is scarce but he disagrees that the market for low-cost homes has dried up.

"I become very impatient with people who point out all the reasons why a good low-cost house cannot be built in 1956 or 1957," he declares. "My answer to them is to think in terms

... of all the families that need, urgently desire, and can buy that kind of house. And the second part of my answer to these people is: go out and build up that market. You can hardly have tapped it so far, and you can get the financing if you will use the new tools at your disposal."

Mr. Cole pointed out that in 1955 construction of low-cost homes was worth at least \$1.5 billion. "Is that kind of market worth having, or isn't it?" he asked. Obviously he felt it was.

THE END

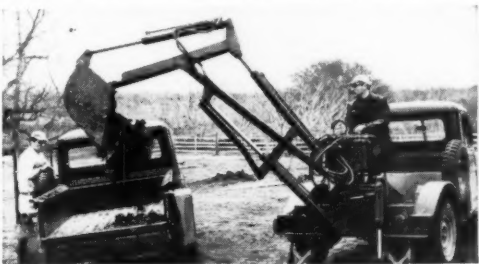


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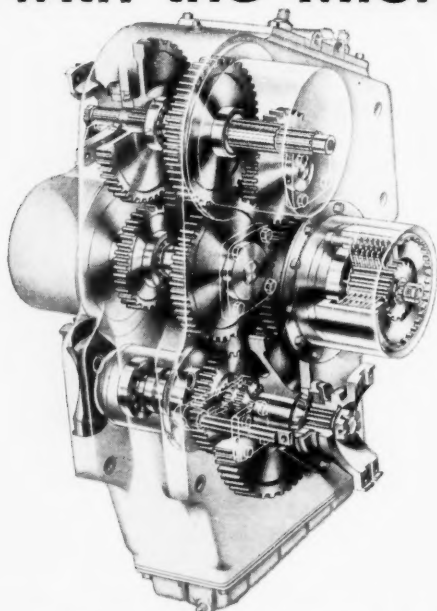
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